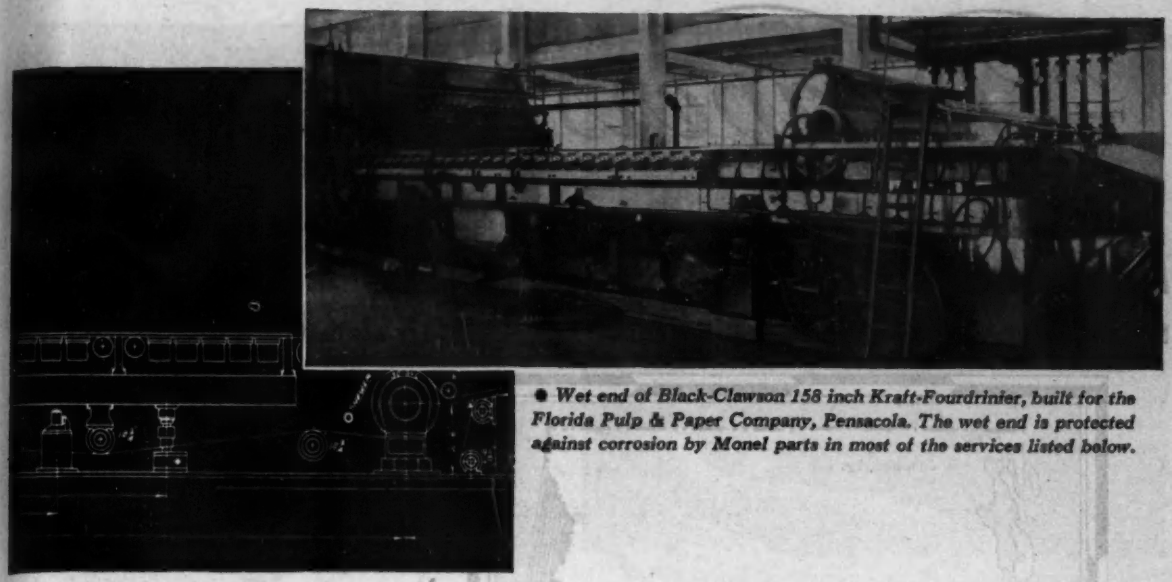


● *Wet end of Black-Clawson 158 inch Kraft-Fourdrinier, built for the Florida Pulp & Paper Company, Pensacola. The wet end is protected against corrosion by Monel parts in most of the services listed below.*

Wire Return Rolls—Monel covers (⅛" thickness) over steel tubes. Roll covers are ground to finished diameter.

Fourdrinier Rails—.037" to .050" Monel sheet lined steel or cast iron rail construction.

Fourdrinier Side Beams—.037" to .050" Monel sheet lining over steel or cast iron rails.

Shaker Springs—"Z" nickel of full hard temper and age hardened is used for flat spring leaves of shakes with high stroke frequencies.

Save-All Trays and Pans—.062" to ⅛" Monel sheet is used generally for strong, durable, welded construction.

Cross Braces—.025" to .037" Monel is used for lining steel pipes.

Fourdrinier Brace Rods—Cold drawn Monel rods.

Remover Cross Drive Shafts—Cold drawn Monel rods.

Remover Beam Tracks—Gall resisting, high hardness cast "S" Monel for rollers or tracks; companion part is bronze.

Fourdrinier Remover Beams—.025" to .037" Monel sheet covered steel construction.

Shower Pipes & Nozzles—Seamless Monel tubing for pipes, and "R" Monel rod (200 BHN) for machined nozzles provide stiff and wear resisting showers.

Doctor Blades & Backs—Full hard Monel blades for bronze rolls. Monel sheet and angles for doctor back construction.

Bolts & Other Fastenings—Monel fastenings are used safely in combination with bronze or copper fourdrinier parts.

CORROSION RESISTANCE OF MONEL TO PAPER STOCKS AND WHITE WATERS OF FOURDRINIERS*

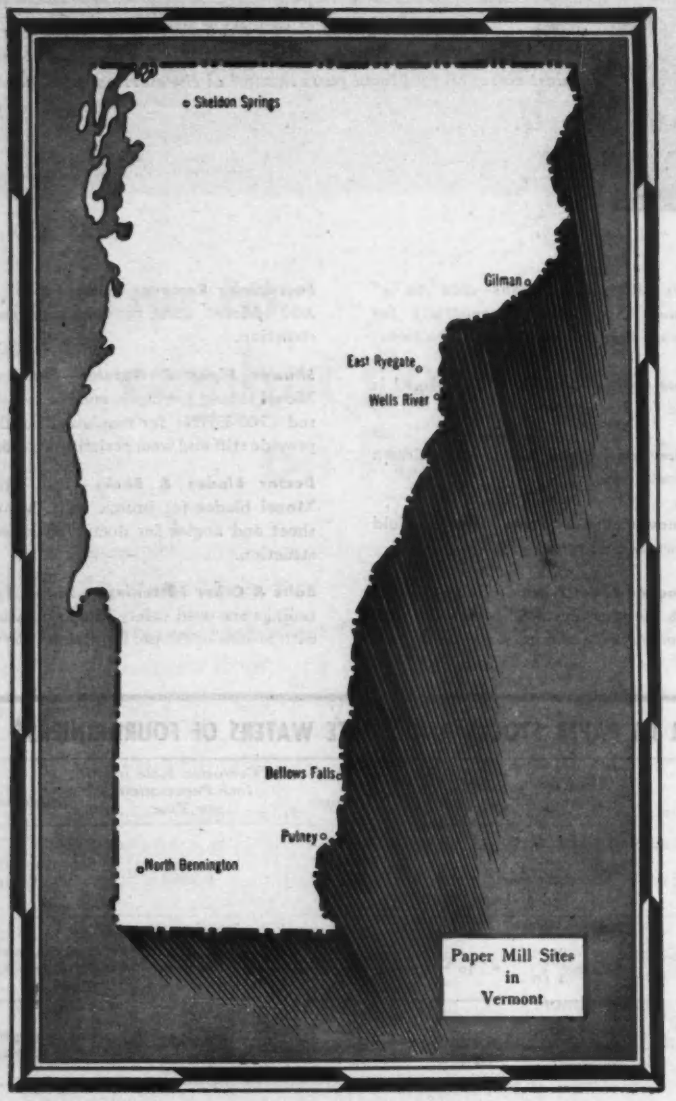
Paper Stock	*Location of Monel Specimen*	*Stock Consistency*	*pH of Stock*	*Temp.*	*Corrosion Rate in Inch Penetration per Year*	*Remarks*
DE-INKED PAPER stock containing small amounts of SO_2, CL_2 and H_2SO_4	Immersed in headbox Middle West Mill.....	.....	4 to 4.5	.....	0.0001	Smooth surface, no pitting
NEWS PRINT 80% groundwood, 15% unbleached sulfite pulp	Immersed in headboxes 3 Northwestern Mills.....	2.8% to 3%	4.7 to 5.1	85° F. Average	0.0003 to 0.0014	Smooth surface, no pitting
KRAFT alum treated	Immersed in headboxes Northern Mill..... Southern Mill.....	....	6.5 to 7 4.5 to 6	95° F. Average	0.0001 0.0005	Smooth surface, no pitting
SULFITE bleached pulp	In save-all trough Middle West Mill.....	0.1%	6.8	140° F. Average	0.0008	Smooth surface, no pitting
BOND AND STATIONERY 100% linen and new cotton, rosin and alum sized	In feed line ahead of machine screen Eastern Mill.....	0.5%	6.5 to 7.3	84 to 130° F.	less than 0.0001	Smooth surface, no pitting
CIGARETTE PAPER	In white water box connected with suction boxes Southeastern Mill.....	.....	9.0 to 10.0	66 to 75° F.	less than 0.0001	Smooth surface, no pitting

**Tests conducted by paper mills in collaboration with Inco Development & Research Division.*
Test method in accordance with ASTM specification A 224-39T.

Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 4 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS



Map copyright by L. D. Post, Inc., New York. American Map Co., N. Y.

HIGH LIGHTS:

Vermont's paper industry was begun about 1790, by the celebrated Col. Matthew Lyon, a brilliant politician of Irish extraction and a founder of the town of Fairhaven, where he erected the first paper mill and established a democratic newspaper. His paper mill survived him and is said to have continued in operation until 1880.

Vermont produces about 83,000 tons of various papers per year from its 9 paper mills and 3 pulp mills. It ranks 22 in paper production in the United States, and has a moderate production of wood pulp.

Vermont has 8 Fourdriniers, 4 cylinder machines and 18 wet machines.

Draper Felts for Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

Canton, Massachusetts

RALPH E. BRIGGS Sales Manager

BRADFORD WEST PITTSFIELD, MASS. • WILLIAM N. CONNOR Jr CANTON, MASS. • L. H. BREYFOGLE KALAMAZOO, MICH. • CHAS. E. BERTSCHY MILWAUKEE, WIS. • W. L. CAMPBELL SAVANNAH, GA. • BALFOUR GUTHRIE & CO. Ltd. PACIFIC COAST

With Geon it's the *combination* of properties that counts

THE processor who coated this lightweight fabric with GEON really "made something of it". For with the application of one of the GEON polyvinyl raw materials he created a fabric possessing many unusual and desirable properties in a *combination* that was *planned* to meet specific needs.

This same type of planning is possible for engineers and designers in the packaging industry just as it is in textiles, shoes, upholstery and many others. For more than 30 distinct properties may be had in an almost unlimited number of *combinations.* For example, products made of GEON may be made to resist water, heat, cold, aging, wear, abrasion, sunlight, chemicals and many other destructive factors. They can be made tasteless, odorless, non-toxic. They may be brilliantly—or softly—colored.

This coated fabric is just one example of what can be done with the GEONS. For in addition to serving as a coating for fabric or paper, the GEONS can be calendered or cast into sheet or film. They can be extruded, pressure or injection molded. Products made of GEON may be flexible or rigid. Doesn't all this suggest some new—or old—product that *you* want to make out of GEON?

Right now all the GEONS are subject to allocation by the War Production Board. Limited quantities can be had for experiment. For more complete information write Department MM-3, Chemical Division, The B. F. Goodrich Company, 324 Rose Building, Cleveland 15, Ohio.

Geon
Polyvinyl Materials

CHEMICAL DIVISION
The B. F. Goodrich Company
324 ROSE BUILDING • CLEVELAND 15, OHIO

PAPER · · · America's 6th Industry

PAPER "WIPE" REPLACES CLOTH

(NEWS ITEM: *Over 20,000,000 lbs. of paper lens tissue was used by the Navy in 1944 as a substitute for wiping rags.*)

The Armed Services are using wiping cloths made of paper instead of critical cotton for cleaning lenses, machinery, etc. Cheaper than cloth, this new paper product is free from lint, grit and acidity. It's as serviceable wet as dry.

Greaseproof paper as a substitute for parchment . . . Laminated Kraft paper bags to replace burlap . . . Paperboard containers to conserve metal . . . Impregnated paper to take the place of cloth . . . New uses for paper, calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

Puseyjones men and production facilities are at war—and Industry at War is Industry thinking and working at hitherto unheard of speeds. Our Research and Development Committee, working on the problems of America at War, is finding many practical and technical advantages that will be of incalculable value to America at peace—to the Paper-Making Machinery of the future.

We are in a position to repair or modernize existing machines where essential to the war effort and as approved by the War Production Board . . . If you have not received your copy of our bulletin, "New Features in Paper Making Machinery", write for it today.

The new Puseyjones Paper Production CALCULATOR is yours for the asking. A time saver for superintendents, engineers, executives or other interested members of your organization.

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery

Wilmington 99, Delaware, U. S. A.

THE SIGN OF SUPERIOR QUALITY

Vol. 120, No. 11

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

March 15, 1945

Joint Printing Committee Opens Paper Bids

Proposals For Supplying Government Printing Office At Washington With Paper For Three-Months' Period Beginning April 1 Are Opened Monday—Committee Meets Mar. 19 To Consider Awards.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 12, 1945—The Joint Congressional Committee on Printing received bids today on paper for the use of the Government Printing Office for the three-months period beginning April 1, 1945. As has been the case quite commonly of late when proposals were advertised for supplying the Government Printing Office with paper for three-months and six-months periods, no bids were received on quite a few items. In case of this kind, the paper will as usual have to be purchased on the open market. The committee will meet Monday, March 19 to consider awards. The bids were as follows:

Newsprint

No. 1—1,500,000 lbs., 24x36—64; rolls, 19, 24, 36 and 48 ins. wide (3-inch fiber cores, weight of cores and wrappers shall be included in net weight).

Old Dominion Paper Co. 2.925c

Telephone Book News

No. 2—150,000 lbs., 24x36—45; rolls, 28, 38 and 48 ins. wide (3-inch fiber cores). (Weight of cores and wrappers shall be included in the net weight.)

Bermingham & Prosser Co. 5.38c

Machine-Finish Book

No. 3—300,000 lbs., 25x38—70; flat, cut any size, min. 21 ins., max. 48 ins.

Marquette Paper Corp. ..... (ceiling price) 7.94c

Barton, Duer & Koch Paper Co... (total 1,000,000 lbs. items 3, 4, 5, 9 and 10)..... 7.97c

No. 4—300,000 lbs., 25x38—70; flat, cut 24x38, 28x38, and 38x48 ins.

Marquette Paper Corp. ..... (ceiling price) 7.94c

Barton, Duer & Koch Paper Co... (total 1,000,000 lbs. items 3, 4, 5, 9 and 10)..... 7.97c

No. 5—300,000 lbs., 25x38—70; flat, cut 24x38, 28x38, and 38x48 ins.

Marquette Paper Corp. 7.94c

Barton, Duer & Koch Paper Co... (total 1,000,000 lbs. items 3, 4, 5, 9 and 10)..... 7.95c

No. 9—200,000 lbs., 25x38—70; rolls, 24, 36, and 48 ins. wide (3-inch fiber cores).

Marquette Paper Corp. ..... (ceiling price) 7.53c

Barton, Duer & Koch Paper Co. (total 1,000,000 lbs. items 3, 4, 5, 9 and 10)..... 7.58c

Mudge Paper Co. 7.59c

No. 10—700,000 lbs., 25x38—80; flat, cut any size, min. width 24 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. (total 1,000,000 lbs. items 3 4, 5, 9 and 10)..... 7.40c

Central Ohio Paper Co. ..... (300,000 lbs. only) 7.42c

Machine-Finish Book End Paper

No. 18—80,000 lbs. Flat, cut 25x38 ins.; 160 lbs., the grain to run the 38-inch way.

Offset Book

No. 19—500,000 lbs., 25x38—80; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

Paper Corp. of U. S. 9.24c

Central Ohio Paper Co. ..... (150,000 lbs. only) 9.27c

No. 20—2,500,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max width 48 ins., the grain to run lengthwise of the sheet.

Wilcox, Walter, Furlong Co. .... (500,000 lbs. only) 8.14c

Offset Poster

No. 21—500,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

Printing Paper

No. 23—70,000 lbs., 25x38—60; flat, cut 28x38 and 38x48 ins.

Graham Paper Co. 8.81c

50% Lightweight Machine-Finish Book

No. 24—40,000 lbs., 25x38—60; flat, cut 38x48 ins. Min. order 10,000 lbs.

50% Antique Book

No. 27.—40,000 lbs., 25x38—80; flat, cut 22¾x31½ ins. Shall be suitable for writing on with ink.

Whitaker Paper Co. 17.10c

Supercalendered Book

No. 33—700,000 lbs., 25x38—90; flat, cut any size, min, width 24 ins., max. width 48 ins.

R. P. Andrews Paper Co. ..... (200,000 lbs. only) 7.85c

No. 34—600,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide (3-inch fiber cores).

R. P. Andrews Paper Co. 7.33c

Central Ohio Paper Co. 7.31c

Mudge Paper Co. ..... (300,000 lbs. only) 7.34c

Machine-Coated Book

No. 37—800,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. .. 6.47c

No. 38—2,500,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. .. 5.87c

No. 39—500,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.

Coated Book

No. 41—400,000 lbs., 25x38—140; flat cut, 32x42, 38x48, 39x50, and 41x52 ins., the grain to run lengthwise of the sheet.

Consolidated Water Power & Paper Co. 6.565c

Ground Wood Mimeograph

No. 44—900,000 lbs., No. 36; flat, cut 32½x42½, and 38x48½ ins., grain as ordered.

Marquette Paper Co. 5.75c

Chemical Wood Mimeographed, White and Colored

No. 45—1,800,000 lbs., white, No 36; flat, cut 32½x42½ and 38x48½ ins.; the grain to run as ordered.

R. P. Andrews Paper Co. ..... (400,000 lbs. only) 7.24c

No. 46—100,000 lbs., blue, buff, green, pink and yellow, No. 36; flat, cut 32½x42½ and 38x48½ ins., the grain as ordered. Min. order, one color, 10,000 lbs.

25 Per Cent Mimeograph

No. 47—400,000 lbs., No. 36; flat, cut 32½x42½; 34½x44, and 38x48½ ins.; the grain to run as ordered.

Aetna Paper Co. 9.63c

Old Dominion Paper Co. 9.97c

Duplicator Copy Paper, Liquid Process, White and Colored

No. 48—400,000 lbs., No. 40; flat, cut 34x44 ins.

No. 49—100,000 lbs., pink and yellow, No. 40; flat, cut 34x44 ins.

Blue U S M O Safety Writing

No. 50—100,000 lbs., No. 32; rolls, 22 ins. wide, 24 ins. in diameter (3-inch fiber cores.)

R. P. Andrews Paper Co. 12.83c

(Continued on page 24)

R. M. Fowler Heads Canadian Association

Appointment As President and A. E. Cadman As General Manager of Canadian Pulp and Paper Association Is Announced By R. L. Weldon, Chairman of Association—Assumes New Duties May 1.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 12, 1945—Appointment of Robert MacLaren Fowler, of Toronto, as president of Canadian Pulp and Paper Association, and of A. E. Cadman, secretary of the association for the past fifteen years, as general manager was announced in a statement issued by R. L. Weldon, chairman of the association, here today. The post of president on a full time basis is a new one for the association, made necessary by the expansion of its activities.

Resigns from Wartime Price and Trade Board

Formerly secretary and general counsel of the Wartime Prices and Trade Board, Mr. Fowler has resigned from that position. His acceptance of the pulp and paper appointment did not take place until after discussions between association representatives and Donald Gordon, chairman of W.P.T.B., the association statement said.

"Mr. Fowler's experience in dealing with matters from a broad and constructive national viewpoint brings to the association one well qualified to coordinate its widespread activities in Canada's largest peacetime manufacturing industry, whose exports exceed in value those of any other Canadian industry. The association is fortunate also in having, in the post of general manager, a continuance of Mr. Cadman's experience in its operations," Mr. Weldon said.

Graduate of University of Toronto

Born in Peterborough, Ontario, Mr. Fowler is the son of Mr. and Mrs. E. Bruce Fowler, who still reside there. Educated in Peterborough, he entered the University of Toronto with the Edward Blake Scholarship in Mathematics, and graduated with honors. He was honor graduate in law from Osgoode Hall, Toronto.

In 1939 Mr. Fowler joined the law firm of McCarthy & McCarthy, Toronto. In November 1942 he joined The Wartime Prices and Trade Board and early in the following year he was named secretary and general counsel of the board. Recently Mr. Fowler became associated with the Ottawa legal firm of Gowling, MacTavish and Watt.

Mr. Fowler married the former Shiela Gordon Ramsay, of Toronto, and they have two children. He is a member of the University Club of Toronto, Rideau Club of Ottawa, and St. James's Club of Montreal. He is active in the Canadian Institute of International Affairs and is a member of the Canadian Youth Commission.

He will assume his new duties about May. 1.

Quebec Pulp and Paper Company

Another development foreshadowing the early re-opening of the long-idle Quebec Pulp and Paper Company's pulp mill at Chicoutimi, on the Saguenay river, has occurred in the Quebec Legislature. Premier Maurice L. Duplessis informed the House that he had been successful in negotiating with the Consolidated Paper Company and Price Brothers and Company, owners of three or four million dollars of common stock of the Quebec Pulp and Paper Company, in having them consent to waive their holdings in favor of the Province to facilitate a reorganization of the Quebec Pulp and Paper Company, now in bankruptcy because of an unpaid claim of over a million dollars to the Quebec Streams Commission, a government organization.

The capitalization of the company consists of 70,000 non-cumulative, redeemable preferred shares of $100 par and 100,000 no par value common shares. Coincident with the announcement, the preferred shares moved against the Montreal market trend on Friday last to show a net gain of 1¾ at 39¼. The issue of 100,000 shares of common has been jointly held in its entirety by Consolidated Paper Corporation and Price Brothers and Company.

Following the Premier's announcement, the Legislature unanimously gave third reading to a bill whereby the power of the Government to effect a reorganization of the company are extended to July 1, 1947. These powers authorize the Government to cede timber limits which would assist in the reopening of the mill, to exchange lands held under letters patent and license, to expropriate lands and to amend regulations respecting cutting of timber on Crown lands in favor of a reorganized company, and to go to the extent of acquiring the capital stocks, bonds, and other securities of any company operating the mill.

The equipment of the mill includes 50 pocket grinders and 50 wet machines, and the capacity is 600,000 lbs. per 24 hours of groundwood (dry).

Ask Basic Reform in Forest Taxation

A Committee representing 10 associations covering the entire timber industry in Canada, has presented to the Cabinet at Ottawa a brief advocating a new national policy in respect to timber taxation throughout Canada. They urged the adoption of three new principles for amending the income tax laws as applied to what they described as Canada's billion dollar forest industries. These are:

1. That the principle of capital gain be recognized in respect of allowance for the exhaustion of timber limits.
2. That a special allowance for exhaustion be granted on account of uninsurable risks inherent in the forest industries.
3. That expenses for reforestation or for securing natural regeneration, and for the protection of timber limits, be chargeable as current operating expenses at the option of the taxpayer.

The committee urged that these revisions be made effective as of the year 1944. It was pointed out, in respect to capital gains, that, under present regulations, if a present owner sells his standing timber, then capital gains (if any) are free. If he cuts his timber, his capital gains are taxed as current income.

Recounts Progress of Institute of Paper

Great Strides Have Been Made In the History of the Institute Secretary Strange Reveals—Qualified Veterans Will Be Admitted In Post-War Years — Discuss Pulpwood Supply — Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., March 12, 1945—Tremendous research developments in the post-war era were forecast for the Institute of Paper Chemistry, Appleton, in a talk given by John Strange, Institute secretary-treasurer, before the Kiwanis Club at Neenah, Wis., on Wednesday, March 7. Great strides have been made in the Institute's 15-year history, and some of the wartime developments are still cloaked in secrecy.

Veterans who qualify academically will be additional students in the post-war period, he said. Only five new students will start their work at the Institute next month.

Mr. Strange said that a similar institute had been set up by the textile industry in Virginia, and by natural gas interests in Chicago. The textile institute, he asserted, is a precise blueprint of the Appleton Institute of Paper Chemistry, "in fact they employed one of our men to run it."

In summarizing the Institute's history, Mr. Strange said: "The idea caught hold because it was an alliance between educational research and industry, for since industry is the primary consumer in the educational market, it ought to contribute more in the educational processes. A new profession was born which we shall hear a great deal about . . . the profession of the industrial scientist.

"Industry knew of the tremendous need for basic research but such work involves many scientists and much equipment, involving considerable money. In such an organization as the Institute of Paper Chemistry, a group of companies could make possible the research work which no one of them could support alone; it also provided for a central library of scientific publications and literature of the past and present, and it provided educational facilities, for in the final analysis the survival of industry depends on the men in them."

The belief that paper is only a cultural product he termed as a misimpression, saying that its byproducts are dividends of a high standard of living. The largest amount of paper is used for functioning purposes, he said.

"Over 90% of the 700,000 necessary articles which go overseas regularly are packaged or protected by paper, while in many of them paper is included as a component part," he asserted. "With the extremely critical shortage of paper, raw material supplies have been changed. New types of woods are being utilized and research must be done on how to pulp it and to determine if it can be used to make good paper. Many fibers used in paper products are no longer available so substitutes must be found for them.

"There has been research on overseas shipping containers, some of which can withstand 48 hours of complete submersion in water plus rough handling without breaking apart. If industry had been asked to develop such a container before the war, it would have said it couldn't be done; but it has been done."

He also told of the Institute's "desert" room and cabinets that can be controlled so as to give extremely cold temperatures. One of the projects now being studied is designs for egg cases, to cut down the heavy breakage on overseas shipments.

Loss of many antiseptics has resulted in a growing problem of pitch and slime, forcing some mills to shut down for days at a time. The Institute is also experimenting with the growth of fungi and mold.

Board Overrules State Court

A directive order by the Regional War Labor Board at Chicago last week in effect overruled the Wisconsin State Supreme Court in the Rhinelander Paper Company case. The WLB order involved the Northern States Power Company, Eau Claire, Wis. It decreed continuance of a union shop clause in the labor contract of the utility.

Vice chairman Philip Marshall, who wrote the 5-1 majority opinion, said the supreme court in the Rhinelander case had held that a WLB order "having been issued in exercise of the war powers of the executive in time of war, supplants and operates to suspend state action."

Discuss Pulpwood Supply

Current and future supplies of pulpwood and timber were discussed last week at a meeting of the Wisconsin Forest Industries Committee at the Wausau Club, Wausau, Wis. Committee members include manufacturers of paper, pulp, lumber, etc.

Folke Becker, president and general manager of the Rhinelander Paper Company, Rhinelander, Wis., is chairman of the committee and the other members are: Harold C. Collins, president of Wausau Paper Mills Company, Brokaw; F. E. Sensenbrenner, assistant secretary of Kimberly-Clark Corporation, Neenah; John Stevens, vice president of Marathon Corporation, Rothschild; E. B. Hurst of the Consolidated Water Power and Paper Company, Wisconsin Rapids; F. G. Kilp of the Nekoosa-Edwards Paper Company, Port Edwards; J. D. Mylrea, president of the Rib Lake Lumber Company; V. I. Ruhmer, manager of the C. M. Christiansen Company, Phelps, and O. T. Swan, secretary of the Northern Hemlock and Hardwood Manufacturers Association, Oshkosh.

Members of the committee expressed belief that proper utilization of the coming crop of timber will assure industries in Wisconsin cities of needed supplies.

Two plans for control were advocated. One, advanced by Michigan conservationists, industrialists and legislators, was explained by Mr. Swan; the other, originated in the Wisconsin Conservation Department, was presented by F. G. Silson, Madison, superintendent of cooperative forestry.

Since Michigan and Wisconsin forest conditions are similar, it was considered desirable to seek conformity by combining features of both proposals. Mr. Becker appointed a committee which will seek to accomplish this objective. Its members are Mr. Hurst, Mr. Swan, William Aberg, Madison, chairman of the Wisconsin Conservation Commission, and Charles F. Smith, Wausau, together with representatives of sawmill interests still to be named.

Sees The Paper Industry at Critical Period

Channeling of Manpower and Materials Into Only Essential Products Is Expected In Midwest To Lead To Drastic Paper Shortages This Year — Lake Shipping To Open In April — Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., March 12, 1945—There is a growing belief in this area that the paper industry is just entering its most difficult stage. The second quarter of 1945 is expected to provoke severe problems arising from a winter which was extremely bad from the standpoint of production and transportation. High water conditions this spring are also expected to have their effect in curtailing production. Meanwhile, demands of liberated countries for supplies are reported to have accentuated the difficulties in supply in the United States.

The "hair shirt" philosophy of the Government with relation to manpower and channeling of raw materials into only essential items is expected to further the drastic shortages in the paper industry especially in those categories where manpower in the paper trade is still classified as "non-essential."

Locally, paper jobbers and sales outlets refuse to discuss any specific problems and there is little variation in the story that civilian supply outlook is dark and that it is becoming increasingly difficult to handle government requirements as well. There is also a growing fear that the narrowed margins in the paper business are going to be bad to the point of strangulation when volume declines.

Paper Houses Discussed

The Chicago Journal of Commerce this week gives a great deal of space to a discussion of the future of houses made of paper. The paper house has been developed through experiments of the Institute of Paper Chemistry and while it can't be made now because of paper shortages, it is reported that it will be practical when waste paper, strengthened and waterproofed by impregnation with sulphur, can be obtained. The material is reported to be strong enough for a prefabricated house eight feet by sixteen feet. However, the $100 cost estimated is based on the assumption that the house will also be equipped with double deck beds at each end, a small stove for heating and cooking besides having window shades, curtains, a rug, cups and dishes all made of paper!

Officials of the National Housing Agency say that such houses won't blow away or get soggy on rainy days and it reports that other materials which can be put to use in house building will make less difference in outward appearance of the structures.

Meanwhile, if the paper industry is too concerned about losing a lot of potential pulp to a new industry, it may take some measure of comfort in noting that the National Lumber Manufacturers Association believes there is no material comparing with wood for house building. He says that the wood industry, too, is experimenting with light, durable and inexpensive house building materials that will compete with satisfactory results in post-war days.

Bill Tilden Visits Salesmen

The western division of the Salesmen's Association of the Paper Industry started out to have an ordinary "week-day" meeting on March 5 but the appearance of two military men turned the session into one of the most interesting of the year. One of the honored guests was a former well known and popular member, Lieutenant Senior Grade William "Bill" Tilden who was doing an excellent job with the Mead Sales Company before the war came along. Bill, looking extremely fit, was given a standing ovation when introduced. He didn't say much because as he expressed it, "when you go on leave you are told to keep your mouth shut." The secrecy was understandable inasmuch as Bill is on the staff of Admiral Wilkinson, operating in the Philippines with the task of seeing that the Marines make their combat landings successfully.

A second guest was Lieutenant Miller of the U. S. Army, son of member George Miller of the Zellerbach Paper Company. Lieutenant Miller has been in service thirty-nine months.

Western division vice president "Pat" Patterson of the Flambeau Paper Company presided at the well attended meeting at the Sherman Hotel and also took the occasion to announce committee chairmen for the forthcoming year. They are as follows: Committee on Education, H. D. Fralick, International Paper Company; Membership, J. I. Heyer, Cherry River Paper Company; Social, Ben K. Babbitt, Brown Company; Golf, F. J. Sensenbrenner, Kimberly-Clark Company and Placement, R. C. Johnson, Fletcher Paper Company. The latter committee is a new and important one designed to aid returning veterans in getting lined up in civilian life when they return to the business world. Vice President Patterson also appointed a three man committee for the March, April and May programs.

The western division of the Salesmen's Association of the Paper Industry officially went on record in extending sympathy to one of its members in the loss of his son-in-law who was in active service in Belgium. The member is Ed Sheaffer, Chicago representative of the Missisquoi Paper Company, whose son-in-law was killed in action on January 12.

Lake Shipping to Open Early

Those elements of the paper trade who depend upon lake shipping for the solution to a part of their transportation problem are grateful for the news that there is less lake ice on the Great Lakes than in a number of years. Many of the waters are virtually free of the usual winter obstruction and there are prospects that lake transportation, as far north as Duluth, can be expected by early April.

D. C. Everest Elected Vice Pres.

The American Forestry Association, Washington, D. C., recently announced election of D. C. Everest, president and general manager of Marathon Corporation, as a vice president. The association, founded in 1875, carries on extensive educational work, including forest fire prevention, reforestation, prevention of soil erosion, advancement of forestry by private endeavor, and teaching of conservation in schools.

MOISTURE CONTENT, TOO, IS "Calipered" CONTINUOUSLY!

Typical installation of Verigraph Control Instruments (left). By a simple setting of one knob, dryers can be made to maintain any specified moisture content in the sheet.

With the Foxboro Verigraph, sheet moisture can be measured and controlled as accurately as sheet thickness!

In more than 250 paper mill installations throughout the U. S. and Canada, Verigraph Moisture Control Systems are on the job – continuously measuring the moisture content of all grades of paper, and regulating dryers to maintain uniform, specified moisture content during manufacture. They are *the only* equipment that will perform these functions and provide a continuous moisture record.

An exclusive Foxboro development, Verigraph Moisture Control Systems apply the unique speed and sensitivity of electronic operation to moisture measurement. They provide instant control action for moisture variations as small as 1/10 of 1%.

Users depend on Verigraph Control to avoid blackening, breaks, curl, and dimensional changes – to gain strength, finish, and uniformity of product.

Write for the full story in illustrated Bulletin 212-2. Or call in a Foxboro Engineer from the nearby Foxboro Office to talk it over. **The Foxboro Company, 114 Neponset Avenue, Foxboro, Mass., U. S. A.** Branches in principal cities.

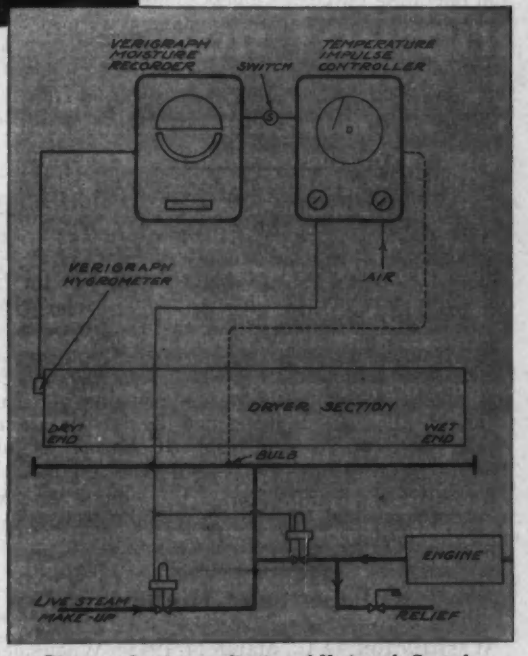


Diagram showing application of Verigraph Control on single section dryer.

FOXBORO REG. U. S. PAT. OFF. **VERIGRAPH MOISTURE CONTROL**

War Delays Paper Mill Machinery

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 14, 1945—Demands on facilities of pulp and paper machinery manufacturers for production of military equipment have delayed production of new mill machinery amounting to more than $9,500,000 worth, officials of the War Production Board Paper and Paper Board Divisions informed the Pulp and Paper Machinery Industry Advisory Committee at a meeting yesterday, WPB reported today.

Members were told that, besides the deferred requests for new mill machinery, over $12,000,000 worth of pulp and paper construction projects also had been deferred. Although in most cases the delay in filling mill machinery requests was reported to be due to lack of facilities, metals and small components, WPB said that most construction projects had been held up by lack of labor and construction materials.

Many pulp and paper machinery plants were reported as now operating from 80 to 90% on war work other than making new mill machinery or spares and replacement parts. This fact in some measure accounts for backlogs of regular industrial orders, which are not to be filled until war orders are completed, committee members reported.

Reviewing the general mill machinery situation, officials said that production of new machinery in the second quarter would be reduced about 25% below that of the first quarter, chiefly as a result of a reduction of available steel amounting to 27% as compared to the first quarter and a cut in copper of 10%. Paper and pulp mill operators have been requested to postpone all repair and other maintenance and operating purchases unless immediately urgent.

Members of the machinery industry were told that little if any unused or unrequired material was returned or reported as surplus in the first quarter, but that such returns should be made so that any available materials may be utilized for necessary repairs and replacements.

Post-War Possibilities of Pliofilm

Developed as a World War II measure for moisture protection of warplane engines in storage and in shipment, dehydrated packaging with Pliofilm has important post-war possibilities also for machinery, instruments and similar products. This picture shows an experimentally-packaged outboard motor, sewing machine, refrigerator compressor unit, saw, shotgun and rifle, all following the warplane engine packaging principle. The saw is being held by Barbara Mezik of the Goodyear Tire and Rubber Company, Pliofilm manufacturer. Protek-Sorb, a desiccant produced by the Davison Chemical Company of Baltimore, is used to absorb residual moisture inside the packages as with the airplane engine package.

Paper Sales Higher

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 14, 1945—Wholesalers' sales of paper and paper products totaled $5,081,000 in January, 14% above those in December, and 4% higher than for the previous January, the Bureau of Census reported this month, based on figures from a representative group of firms.

Inventories as shown by a reporting group had declined 3% in January from December levels, and were 8% below those of January, 1944.

Paper Production for January

The following data cover all known mills and represent a continuation of the monthly statistics initiated in "Facts for Industry," series 24-2-1. For annual data and a description of the statistics, "Facts for Industry," series 24-1-2 should be consulted. All inquiries concerning these data should be addressed to the Bureau of Census, Washington 25, D. C.

Type of paper	January 1945	1944 December[1]	1944 January[1]
All types	1,444,578	1,326,965	1,411,268
Newsprint	60,386	61,146	60,101
Groundwood papers	52,034	48,419	48,840
Printing	19,562	19,115	19,760
Specialties	32,472	29,304	29,080
Book papers	121,373	114,517	122,772
General printing	91,801	85,432	88,195
Converting papers	29,330	28,966	34,508
Other book papers	242	119	69
Fine papers	85,748	79,669	78,323
Writing papers	64,644	60,533	57,137
Cover and text	4,301	3,286	4,780
Reproduction	4,380	4,318	4,017
Bristols[2]	7,007	6,623	7,721
Thin papers	5,178	4,573	4,473
Other fine papers	238	336	195
Wrapping papers	165,989	148,311	166,487
Bag papers	31,547	27,780	39,902
Glassine	6,623	6,150	7,289
Greaseproof	2,035	2,024	2,022
Vegetable parchment	2,578	2,854	2,730
Converting papers	60,116	59,168	61,504
Wrapping papers	63,090	50,335	53,040
Multi-wall sack papers	31,464	30,899	30,054
Special industrial papers	18,343	19,922	18,999
Sanitary papers	70,269	65,514	67,682
Tissue papers	12,637	11,721	13,739
Absorbent papers	7,489	7,337	7,618
Building papers	72,572	68,095	72,519
Paperboard	746,274	673,415	724,134
Container board	345,827	308,796	340,343
Folding boxboard	185,151	167,605	161,986
Set-up boxboard	59,233	55,751	61,353
Cardboard	5,827	6,073	4,849
Building board	88,006	80,122	92,315
Miscellaneous other board	62,230	55,068	63,288
Tube stock	41,095	34,219	42,040

[1]Revised.
[2]Includes Government Postal Card Stock.

Butler-Deardon Co. Elects Officers

[FROM OUR REGULAR CORRESPONDENT]

WORCESTER, Mass., March 12, 1945—The Butler-Deardon Paper Company of this city held an election in order to fill the vacancy left by the death of its secretary, the late Walter Deardon.

Walter G. Butler was elected president; E. Claire Butler, treasurer, and Roy F. Dutcher, secretary and manager.

Mr. Dutcher has been one of the bigger factors in the great success of the Butler-Deardon Company as he has had many years experience in the paper business. He at one time was manager of the cost and statistical department of Strathmore Paper Company; office and inside sales manager for the Rourke-Eno Paper Company, of Hartford, Conn.

He has many valuable connections with paper mills and is very well-known throughout the entire paper industry, particularly so in New England.

Duty on Waterleaf Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 14, 1945—Representative Shafer of Michigan has introduced H.R. 2442 with respect to the duty on waterleaf paper. The bill, which has been referred to the House Committee on Ways and Means, follows:

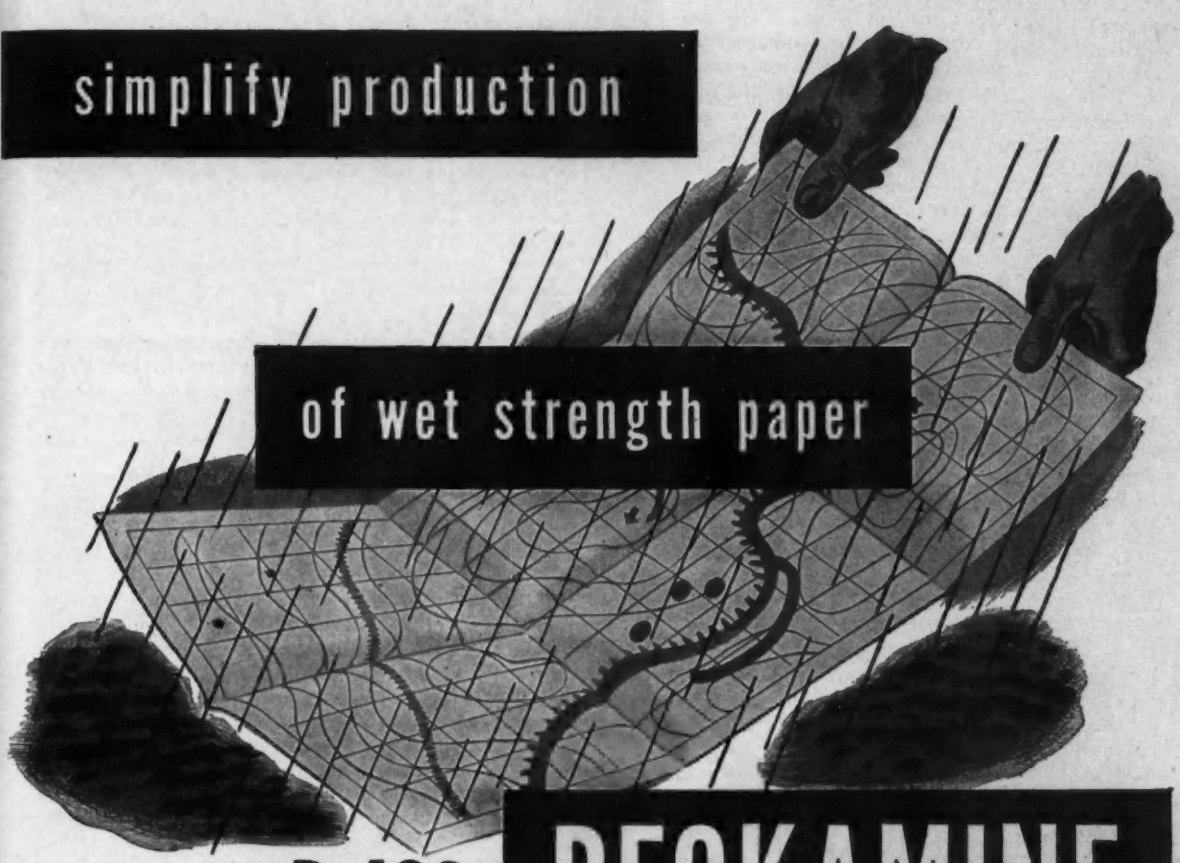
"That paragraph 1409 of schedule 14 of the Tariff Act of 1930 is amended by inserting after 'blotting paper, 30 per centum ad valorem'; the following: 'uncoated paper commonly or commercially known as waterleaf paper for use for the manufacture of vegetable parchment paper, 10 per centum ad valorem'."

WORLD'S LARGEST PRODUCER OF SYNTHETIC RESINS

RCI

simplify production

of wet strength paper



WITH P-426 BECKAMINE

This material is subject to WPB Order M-300, Schedule 34. According to these provisions the purchaser only needs to certify end use or uses on purchase order.

There should be no hesitancy in placing orders as most end uses are being approved.

Paper is better—*wet or dry*—when you add P-426 Beckamine. Applied directly to the beater, fan pump or head box exactly as it comes to you, this outstanding urea formaldehyde resin makes an appreciable difference in tensile strength, fold and Mullin—*while the increase in wet strength is truly remarkable.* And in addition it is exceptionally stable in storage. Properties, price and results all point to P-426 Beckamine. Write to RCI—world's largest producer of synthetic resins—for more detailed information.

REICHHOLD CHEMICALS, INC.

General Offices and Main Plant, Detroit 20, Michigan

Other Plants: Brooklyn, New York • Elizabeth, New Jersey • South San Francisco, California • Tuscaloosa, Alabama • Liverpool, England • Sydney, Australia

SYNTHETIC RESINS • CHEMICAL COLORS • INDUSTRIAL PLASTICS • INDUSTRIAL CHEMICALS

Pacific Mills Buys Box Plant

Pacific Mills Limited which operate a pulp and paper mill at Ocean Falls and a paper converting and processing plant at Vancouver have purchased the business of Canadian Box Limited, Industrial Avenue, Vancouver, B. C. The rapidly expanding business of Canadian Box Limited will be operated as a wholly-owned subsidy by the company, according to P. E. Cooper, president of Pacific Mills.

Employing 125, Canadian Boxes is the sole company producing corrugated fiber containers west of Winnipeg. Established in 1925 with capitalization of $200,000, it has made five additions, and more than doubled its employees in the last five or six years and now occupies the whole block adjoining Station Street.

Pacific Mills, with a big pulp mill at Ocean Falls, and distributing and manufacturing plant here, makes solid fiber containers and has embarked on a program for full utilization to the end products of material going through its mills.

P. E. Cooper has been named president of Canadian Boxes; Jack Young vice-president and treasurer, and James Lawson, secretary.

Distribution and working staff will be continued with Charles H. Forster as sales manager; Roy Armstrong, office manager, and Gordon Sharpe, plant superintendent. J. H. McDonald retired recently as managing director. Ownership has previously been in Vancouver and the East.

Surplus Board Sets Up Agencies

The Surplus Property Board today announced it had established an advisory council of 19 Government agencies through which these agencies can present their views to the board of matters relating to the care, handling and disposal of surplus property. Principal representatives of these agencies will meet from time to time with the three members of SPB and the Administrator.

While a similar group acted in an advisory capacity for the former Surplus War Property Administration, the Surplus Property Act of 1944 did not specify that an advisory board should be included in the new Surplus Property Board's set-up. Nevertheless, SPB felt that the establishment of such a council would provide a useful forum in which these agencies could present their views on surplus matters, the board said.

The 19 agencies on the advisory council are: State Department, War Department, Navy Department, Justice Department, Department of the Interior, Procurement Division of the Treasury Department, United States Maritime Commission, Reconstruction Finance Corporation, War Production Board, Office of Price Administration, Veterans Administration, Federal Works Agency, Civil Aeronautics Board, Smaller War Plants Corporation, Foreign Economic Administration, War Food Administration, Department of Agriculture, National Housing Agency and Office of Contract Settlement.

Bulkley, Dunton Pulp Co. Moves

The Chicago regional office of the Bulkley, Dunton Pulp Company, formerly located at 80 East Jackson boulevard, has been moved on March 15 to substantially larger quarters at 120 South LaSalle street, Chicago 3, it has been announced by the company's headquarters in New York. L. W. Lawrence is in charge of the Chicago office.

Two Technicians Join M. & O.

Two technicians who will aid in post-war plans for the development of new papers and paper products have joined the research department of Minnesota and Ontario Paper Company, it is announced by R. H. M. Robinson, president.

The two, both of whom will be stationed at Mando mills in International Falls, Minn., on the Canadian border, are George H. McGregor, to be in charge of pulp research; and Leo A. Willoughby, who will have charge of extension of the paper coating process from the present pilot plant stage.

Mr. McGregor, a graduate of University of Wisconsin, 1926, B.S. and M.S., chemistry and chemical engineering, is well known in paper manufacturing circles. He is now chairman of the Acid Pulping Committee TAPPI and has held other offices in that association. He was technical director of the pulp division of Weyerhaeuser Timber Company and also general superintendent of that division. Mr. McGregor has written many papers and articles on pulp and paper.

Mr. Willoughby was formerly associated with Oxford Miami Paper Company and Bryant Paper Company. With the latter, he served as superintendent of the coating division.

Calco To Build at St. Marys

American Cyanamid Company has just announced the purchase for the Calco Chemical Division of a factory site along the Ohio River, near St. Marys, W. Va. Consisting of 800 acres of land, the site is 16 miles northeast of Parkersburg, 75 miles north of Charleston, and 12 miles from Marietta, Ohio.

Acquisition of this plant site is an important addition to the Calco Chemical Division and will provide a location for the development of new products whose basic raw materials are available in the Ohio Valley trade center. It will also enable the Calco organization to broaden its activities through the introduction of new products developed by the Cynamid organization at Stamford, Conn., as well as those developed by Calco's own research group.

Located in a section of great natural beauty, the new Calco site is sufficiently close to important cities like Marietta, St. Marys, and Parkersburg to afford attractive living conditions for the personnel who will be connected with the plant when it has been erected.

Modern Packages Incorporates

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., March 12, 1945—Articles of incorporation have been filed with the secretary of state here by Modern Packages, Inc., Division street, Elkhart, Ind., formed to manufacture paper boxes, paper board and cartons. The corporation has 3,000 shares of no par value capital stock and the incorporators are Richard L. Snideman, Charles W. Dunnington and John C. Hendricks Jr.

Consolidated Paper Corp. Formed

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., March 12, 1945—The Consolidated Paper Products Corporation, 561 Windsor street, Somerville, Mass., has been incorporated with capital stock of 600 common shares. Henry Nadell is president; Leo Flax, 43 Hobart road, Newton, Mass., treasurer, and Joseph S. Ginsburg, clerk.

Steady Hands . . .

View of Kettle Room at Niagara Alkali Plant

NIAGARA has greatly expanded its facilities to meet the enormous war demands for electro-chemical products. Thus as we turn to meet the growing peacetime requirements we remain "steady hands" at the job of producing materials for which Niagara has won an outstanding reputation as a quality house. This is assurance of continued good service and improved quality to those old customers who have relied upon Niagara for many years. And to new customers it means confidence in obtaining the highest standards of quality and the most experienced technical cooperation in the postwar era when electro-chemical products will be in increasing demand.

Niagara ALKALI COMPANY

60 EAST 42nd STREET, NEW YORK 17, N. Y.

CAUSTIC POTASH • CAUSTIC SODA • PARADICHLOROBENZENE • CARBONATE OF POTASH • LIQUID CHLORINE

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending March 10, 1945

STOCKS

	High	Low	Last
A. P. W.	5¼	4¾	4¾
Armstrong Cork Co.	46¾	44½	44¼
Celotex Corp.	17¼	15⅝	15⅞
Celotex Corp., pf.	20⅛	19¾	19⅞
Certain-Teed Products Corp.	9	8	8¼
Certain-Teed Products Corp., pf.	152	152	152
Champion Paper & Fibre Co.	33⅛	30½	32
Champion Paper & Fibre Co., pf.	113	112	113
Congoleum Nairn Co.	28¼	27½	28½
Container Corp. of America	29⅝	27	27¼
Continental-Diamond Fibre Co.	12¼	10⅞	11
Crown-Zellerbach Co.	23⅞	21⅝	21⅞
Crown-Zellerbach Co., pf.	105	104¼	104¼
Dixie Cup Co.	20¼	19	19
Dixie Cup Co.—A	48¾	47¼	48
Flintkote Co.	28¾	25⅞	26¾
Flintkote Co., pf.	105½	105½	105½
Robert Gair	6⅜	5½	5⅞
Robert Gair, pf.	17⅞	16⅝	16⅞
International Paper Co.	25¼	22⅜	23¼
International Paper Co., pf.	92	89	89⅞
Johns-Manville Corp.	111	106	107
Johns-Manville Corp., pf.	...	...	...
Kimberly-Clark Corp.	45½	42½	42½
Mac Andrews & Forbes	31⅞	31⅞	31⅞
Mac Andrews & Forbes, pf.	152	149	149
Masonite Corp.	46½	43	43¾
Mead Corp.	14¼	12¾	13¼
Mead Corp., pf. A—6%	102	100	100
Mead Corp., pf. B—5½%	100	100	100
National Container Corp.	14⅛	12⅝	13
Paraffine Companies, Inc.	64½	64	64½
Paraffine Companies, Inc., pf.	...	...	...
Rayonier, Inc.	18½	17⅛	17¾
Rayonier, Inc., pf.	35⅞	35½	35¾
Ruberoid Co.	38	35½	35½
Scott Paper Co.	44	43¼	43¾
Scott Paper Co., pf.	112	112	112
Sutherland Paper Co.	33½	33	33
Union Bag & Paper Corp.	17	14⅜	16
United Paperboard Co.	7½	6¾	6¾
U. S. Gypsum Co.	84¼	79½	82
U. S. Gypsum Co., pf.	...	...	...
West Virginia Pulp & Paper Co.	25⅝	23½	23½
West Virginia Pulp & Paper Co., pf.	109	109	109

BONDS

Abitibi Pulp & Paper Co. 5s '53	104½	102¾	102¾
Celotex Corp. 3¾ '55	103¾	103¼	103¼
Certain-Teed Products Corp. 5½s '48	101⅝	100¾	101½
Champion Paper & Fibre Co. 4¾s '50	...	...	...
International Paper Co. 6s '55	109½	109	109½
International Paper Co. 5s '47	104¼	104	104
Mead Corp. 3½s '53	...	...	...
West Virginia Pulp & Paper Co. 3s '54	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending March 10, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	38	37	37
Hummel-Ross Fibre Corp.	8½	7½	7⅝
St. Regis Paper Co.	6½	5¾	6
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	6⅝	6¼	6¼

BONDS

American Writing Paper Co. 6s '61	101	101	101

Dixie Cup Earns $2.31

The Dixie Cup Company and subsidiaries, for the year ended December 31, reports a net income of $915,767 after taxes and charges, equal after class A dividends to $2.31 a share on 202,666 common shares; year ago $904,972 and $2.26 a share. Cash $1,573,307, compared with $1,239,537; marketable securities $529,175, compared with $513,173; inventories $1,957,772, compared with $2,091,756; receivables $877,379, compared with $961,558; current liabilities $1,282,135, compared with $1,316,938.

West Virginia Nets 41 Cents

The West Virginia Pulp and Paper Company and subsidiaries, for the three months ended January 31, reports a net income of $538,738 after taxes and charges, equal after preferred dividends of 41 cents a share on 902,432 common shares; year ago $623,625 and 50 cents a share.

Howard Smith Votes Dividend

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., March 12, 1945—The directors of Howard Smith Paper Mills, Ltd., declared an initial quarterly dividend of 25 cents a share on the common stock, payable April 30, which represents the first dividend on the company's common in 20 years. The last common dividend paid was 2½% in 1924 on the old 1919 $100 par common stock. The present common was issued in 1928. This places the stock on a $1 annual dividend basis, it is believed, as indicated by reference to this initial dividend as being for the quarter ending March 31, 1945. At the current price of around $22.50 the stock would return about 4.45% on an annual basis. The earnings record in recent years and the greatly improved financial position of the company indicate its ability to maintain this dividend, it is believed in investment circles. The company also declared a regular quarterly dividend of $1.50 on the preferred stock, payable April 20 to stock of record March 31. Holders of the old company received in 1928 $100 cash plus two of the present common shares.

Hinde & Dauch Profits Up

Hinde & Dauch Paper Company of Canada, Ltd.: for the year ending December 31, 1944, report a net profit of $418,436, after depreciation, bond interest and income and excess profits taxes and not including refundable portion of excess profits tax. In 1943 profit was $378,880. Earnings in 1944 equalled $1.40 and 1943 $1.26 a share. Net working capital in 1944 was $2,358,957 and in 1943, $2,023,315. Sidney Froman, president, states that production of the company's paper board mills was 1.95% less than mill production in 1943. A principal reason for this decrease was that mills averaged 9.3 days less running time in 1944, due to causes beyond control.

Puget Sound Declares Dividend

The directors of Puget Sound Pulp and Timber Company have declared a dividend of 25c a share on the common stock of the company payable March 31 to stockholders of record at the close of business March 19, 1945. In 1944 a total of $1.00 a share was paid on the common stock. The directors also declared the regular quarterly dividend of 30c a share on the preferred stock payable April 1 to stockholders of record at the close of business March 19, 1945.

Nashua Co. Nets $13.93

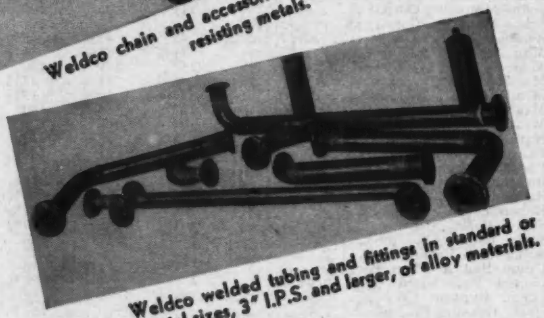
The Nashua Gummed and Coated Paper Company, for 1944, reports a consolidated net profit of $641,907, equal to $13.93 a share on 46,059 common shares, including extraordinary credit of $135,677 representing net insurance collected on death of W. L. Carter, former president. Consolidated net profit for 1943 was $470,363, or $10.21 a share. Provision for taxes, after deducting post-war credits, was $1,127,759, compared with $757,331 for 1943.

Hammermill Profits Off

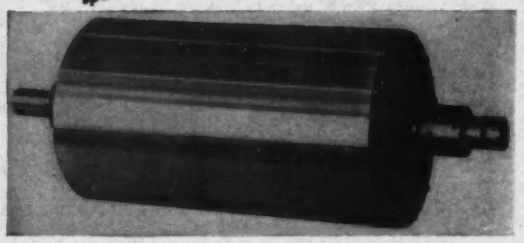
The Hammermill Paper Company and subsidiary, for 1944, reports a net income after $1,125,000 taxes, of $453,395 or $1.92 a common share, subject to renegotiation. This compared with 1943 net, after renegotiation, of $585,028, or $2.64 a common share, after $1,078,000 tax charges.

The Youngstown Welding & Engineering Company specializes in fabricating equipment from alloys.

Weldco chain and accessories made of corrosion resisting metals.



Weldco welded tubing and fittings in standard or special sizes, 3" I.P.S. and larger, of alloy materials.



Rolls for paper mills and other industries are covered with Monel, stainless steel, etc. to resist corrosion and to give longer life.

"WELDCO" is the trade name of The Youngstown Welding & Engineering Company, specialists since 1912 in fabricating alloy steels and other corrosion resisting metals.

HERE'S WHAT WELDCO CAN DO FOR YOU

American industry is chock-full of chronic production delays due to equipment and product failures which result from rust and corrosion. Practically alone in its specialized field, The Youngstown Welding & Engineering Company designs and builds special parts and equipment of all kinds of corrosion resisting metals. After 33 years' experience, Weldco engineers know what metal will meet best your combined corrosion and production problem. In a large, well equipped plant, men who "know how" fabricate these tricky metals into dependable equipment. Remember the cost of corrosion is far more than the cost of Monel, Inconel, Stainless Steel and other metals used properly.

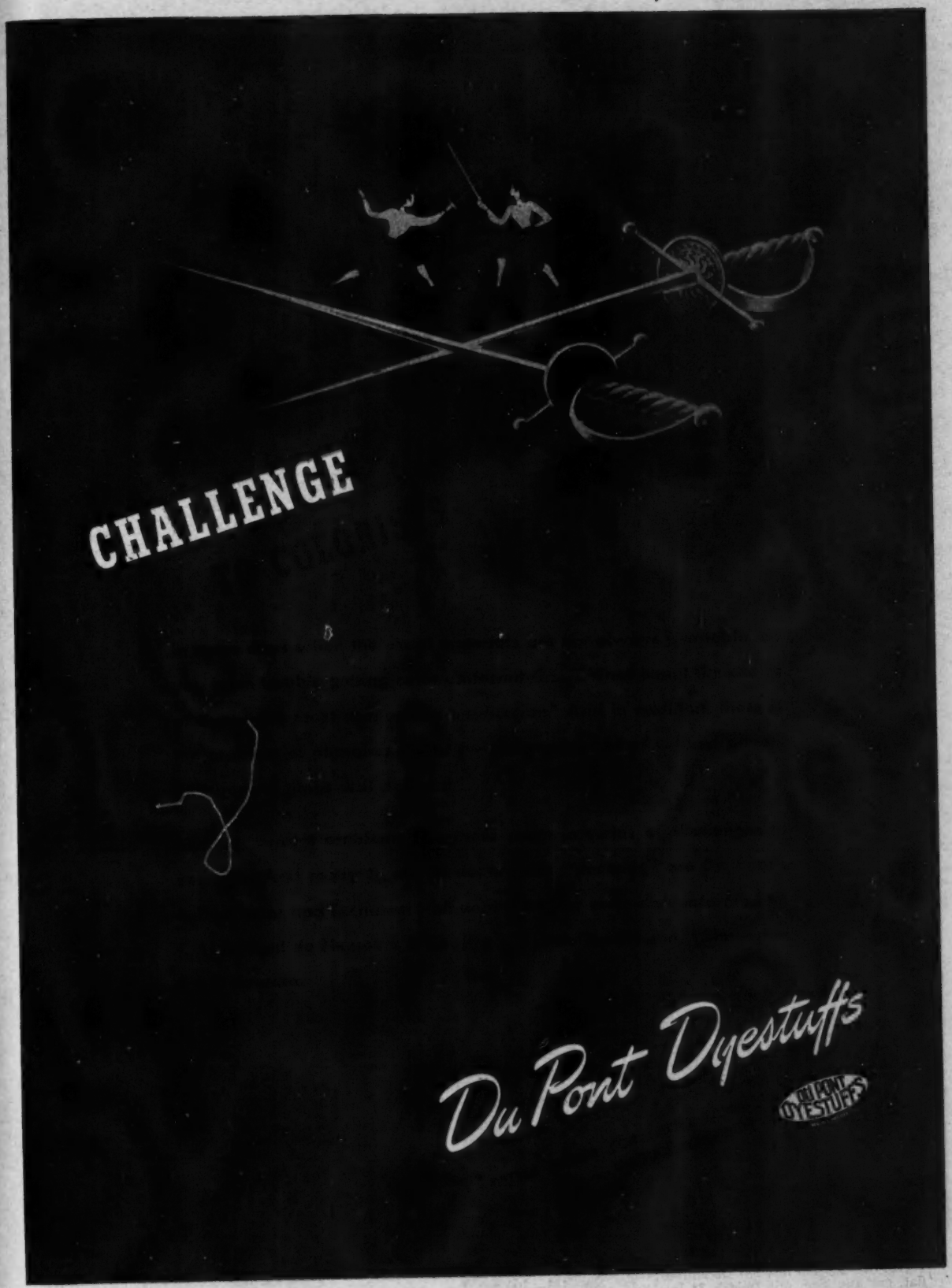
So let Weldco engineers help you; write today stating your problem.

Weldco engineers will design and build large or small, special or standard equipment to help solve your corrosion problems. A partial list of Weldco products made of corrosion and rust resisting Monel, Inconel, cupro nickel, nickel, stainless steel, and alloys are: tubing, fittings, chain and accessories, pickling and heat treating crates and baskets, steam jets, tanks, kettles, agitators and miscellaneous rolls. WRITE FOR LITERATURE, stating your problem.

WELDCO *Specialists in Corrosion Resistance*

THE YOUNGSTOWN WELDING & ENGINEERING CO.

3751 OAKWOOD AVE., YOUNGSTOWN, OHIO


CHALLENGE
Du Pont Dyestuffs
DUCO DYESTUFFS

JOINT PRINTING COMMITTEE OPENS PAPER BIDS

(Continued from page 11)

Ground Wood Writing, White and Colored

No. 52—300,000 lbs., white, No. 32; flat, cut any size, min. width 28 ins., max. width 48 ins.

No. 53—500,000 lbs., white, No. 36; flat, cut any size, min, width 28 ins., max. width 48 ins.

Frank Parsons Paper Co. 6.40c

Chemical Wood Writing, White and Colored

No. 55—1,500,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

R. P. Andrews Paper Co. .....
(300,000 lbs. only) 7.82c

Whitaker Paper Co. .....
(maximum 400,000 lbs. for lots 55, 56, 57 and 58) 7.69c

No. 56—5,000,000 lbs., white No. 36; flat, cut any size, min. width 21 ins., max. width 48 ins.

Whitaker Paper Co. .....
(maximum 400,000 lbs. for lots 55, 56, 57 and 58) 7.44c

No. 57—2,000,000 lbs., white, No. 32; rolls, min. width 16 ins., max. width 48 ins. (3-inch fiber cores).

R. P. Andrews Paper Co. .....
(500,000 lbs. only) 7.59c

Paper Corp. of U. S. .....
(200,000 lbs. only) 7.49c

Whitaker Paper Co. .....
(maximum 400,000 lbs. for lots 55, 56, 57 and 58) 7.21c

No. 58—2,000,000 lbs., white, No. 36; rolls, min. width 16 ins., max. width 48 ins. (3-inch fiber cores).

R. P. Andrews Paper Co. .....
(300,000 lbs. only) 6.99c

Whitaker Paper Co. .....
(maximum 400,000 lbs. for lots 55, 56, 57 and 58) 7.09c

No. 59—1,000,000 lbs., blue, buff, green, pink, salmon and yellow Nos. 32 and 36; flat cut any size, min. width 21 ins., max. width 48 ins. Min. order, one color, 10,000 lbs.

Marquette Paper Co. (sub. 32).. 8.54c
(sub. 36) 8.09c

No. 60—150,000 lbs., blue, buff, green, pink, salmon, and yellow, No. 32; rolls, 38 ins. (3-inch fiber cores).

"V" Mail Writing

No. 61—400,000 lbs., No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

No. 61A—1,600,000 lbs., No. 32; rolls, min. width 18 ins., max. width 48 ins. (3-inch fiber cores).

Chemical Wood Writing (Titanium Dioxide Filled)

No. 61B—1,000,000 lbs. No. 32; flat, cut 34x44 ins.

Barton, Duer & Koch Paper Co. .. 8.83c

High Wet Strength Map

No. 63—150,000 lbs. No. 48; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Paper Corp. of U. S. 13.25c
Frank Parsons Paper Co. 12.89c
Barton, Duer & Koch Paper Co. .. 13.25c

50% Lithograph-Finish Map

No. 64—200,000 lbs. No. 32 and 40; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Aetna Paper Co. .....(sub. 32) 15.91c
(sub. 40) 15.43c

No. 65—310,000 lbs. Nos. 48 and 56; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Stanford Paper Co. .....
(sub. 48 100,000 lbs. only) 15.48c
(sub. 56 100,000 lbs. only) 15.38c

75% Lithograph-Finish Map

No. 66—175,000 lbs. Nos. 32 and 40; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; ream markers to be omitted.

Barton, Duer & Koch Paper Co. ..
(100,000 lbs. only) 18.00c

Mudge Paper Co. .....(sub. 32) 18.25c
(sub. 40) 17.75c

50% White Chart, Lithograph-Finish

No. 68—422,000 lbs. No. 72; flat, cut any size, min. width 22 ins., max. width 46 ins.; the grain to run lengthwise of the sheet unless otherwise specified.

Franklin Research Co. 19.425c

Stanford Paper Co. .....
(100,000 lbs.) 17.25c
(66,000 lbs.) 19.00c

Barton, Duer & Koch Paper Co. ..
(100,000 lbs. only) 18.75c

Chemical Wood Manifold, White and Colored

No. 71—300,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42 and 34x44 ins.; the grain to run 21-inch and 42-inch ways.

No. 72—80,000 lbs., white, No. 18; rolls, 24 ins. wide (3-inch fiber cores).

No. 73—100,000 lbs., blue, cherry, green, pink, salmon and yellow, No. 18; flat, cut 21x32, 22x34, 28x34, 32x42, and 34x44 ins.; the grain to run the 21-inch and 42-inch ways. Min. order, one color 5,000 lbs.

50% Manifold, White and Colored

No. 75—35,000 lbs., white, No. 14; flat, cut 38x48 ins.; min. order 5,000 lbs.

No. 76—100,000 lbs., white, No. 18; flat, cut 21x32, 22x34, 28x34, 32x42, and 34x44 ins.; the grain to run the 21-inch and 42-inch ways.

Paper Corp. of U. S. .....
(50,000 lbs. only) 24.74c

Stanford Paper Co. .....
(40,000 lbs. only) 21.00c

Old Dominion Paper Co. .....
(50,000 lbs. only either lots of 76 or 78, not both) 19.997c

No. 77—80,000 lbs., white, No. 18; rolls, 24 ins. wide (3-inch fiber cores).

Paper Corp. of U. S. 23.74c

No. 78—80,000 lbs., blue, cherry, green, pink, salmon and yellow, No. 18; flat cut 21x32, 22x34, 28x34, and 34x44 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 5,000 lbs.

Old Dominion Paper Co. .....
(50,000 lbs. only either lots 76 or 78, not both) 19.997c

50% White Glazed Manifold

No. 85—100,000 lbs., No. 16; flat, cut 28x34; the grain to run the 28-inch way. Min. order 20,000 lbs.

Barton, Duer & Koch Paper Co. .. 26.00c

Chemical Wood Bond, White and Colored

No. 101—300,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins.; max. width 38 ins.

Eastern Corp. 11.46c

No. 102—400,000 lbs., white, No. 32; flat, cut any size, min width 21 ins.; max. width 38 ins.

Eastern Corp. 9.31c

No. 103—100,000 lbs., blue, No. 32; flat, cut 32x42 ins.

Eastern Corp. 10.04c

No. 104—100,000 lbs., blue, buff, green, pink, salmon, and yellow No. 26; flat cut any size, min. width 21 ins., max. width 38 ins. Min. order, one color, 5,000 lbs.

25% Bond, White and Colored

No. 105—100,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins.; max. width 48 ins.

Aetna Paper Co. 17.39c
Barton, Duer & Koch Paper Co. .. 17.91c

No. 106—500,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Aetna Paper Co. .....
(total 600,000 lbs. only lots 106 and 107) 14.39c

No. 107—500,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Aetna Paper Co. .....
(total 600,000 lbs only lots 106 and 107) 14.39c

No. 110—250,000 lbs., blue, buff, cherry, green, pink, salmon and yellow No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Aetna Paper Co. 15.09c

No. 111—250,000 lbs., blue, buff, cherry, green, pink salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max width 48 ins.

Aetna Paper Co. 15.09c

Chemical Wood White Ledger

No. 151—200,000 lbs., No. 48, flat, cut any size, min. width 17 ins., max. width 48 ins.

Wilcox, Walter, Furlong Paper Co. 8.65c
Eastern Corp. 9.60c

No. 152—200,000 lbs., No. 56; flat, cut any size, min. width 17 ins., max. width 48 ins.

Wilcox, Walter, Furlong Paper Co. 8.65c
Eastern Corp. 9.60c

25% Ledger, White and Colored

No. 154—500,000 lbs., white, No. 48; flat, cut 22x34, 24x38, 28x34, 32x42, 34x44 and 38x48 ins. Min. order, one substance, 5,000 lbs.

Aetna Paper Co. .....
(100,000 lbs. only) 14.39c

No. 155—300,000 lbs., white, No. 56; flat, cut 22x34, 24x38, 28x34, 32x42, 34x44 and 38x48 ins. Min. order, 5,000 lbs.

Aetna Paper Co. .....
(100,000 lbs. only) 14.39c

No. 156—100,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 56; flat, cut 24x38, 28x34 and 34x44 ins. Min order, one substance, one color, 5,000 lbs.

Aetna Paper Co. 15.09c

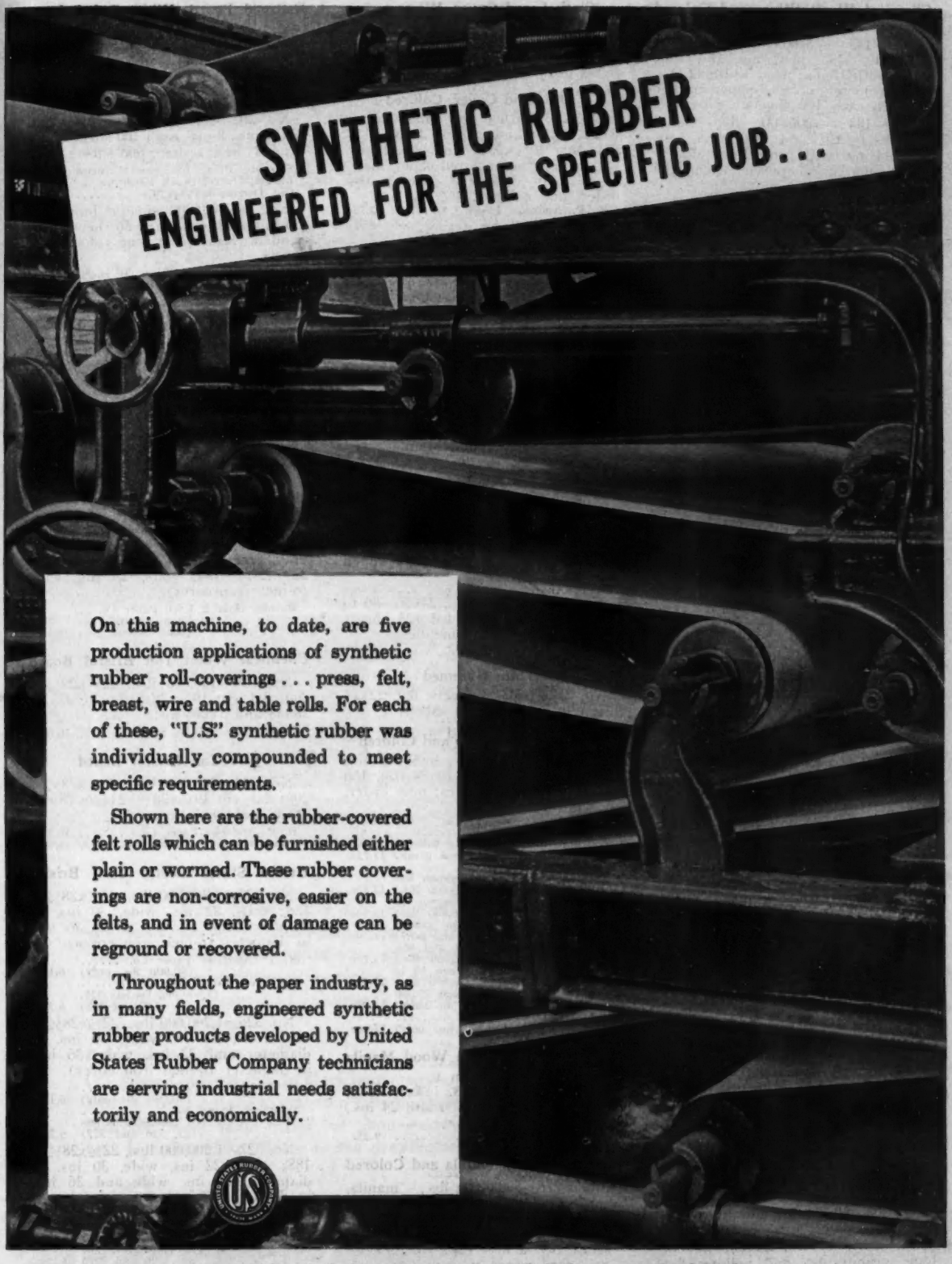
100% White Ledger

No. 176—40,000 lbs., No. 48; flat, cut 24x38, 28x34, 32x42, 34x44 and 38x48 ins. Min. order, 4,000 lbs.

R. P. Andrews Paper Co. 28.13c
Barton, Duer & Koch Paper Co. .. 25.15c

No. 177—100,000 lbs., No. 64; flat, cut 24x38, 28x34, 32x42, 34x44 and 38x48 ins. Min. order, 5,000 lbs.

R. P. Andrews Paper Co. 28.13c
Barton, Duer & Koch Paper Co. .. 25.15c



On this machine, to date, are five production applications of synthetic rubber roll-coverings . . . press, felt, breast, wire and table rolls. For each of these, "U.S." synthetic rubber was individually compounded to meet specific requirements.

Shown here are the rubber-covered felt rolls which can be furnished either plain or wormed. These rubber coverings are non-corrosive, easier on the felts, and in event of damage can be reground or recovered.

Throughout the paper industry, as in many fields, engineered synthetic rubber products developed by United States Rubber Company technicians are serving industrial needs satisfactorily and economically.

Listen to "Science Looks Forward"—new series of talks by the great scientists of America—on the Philharmonic-Symphony program. CBS network, Sunday afternoon 3:00 to 4:30 E.W.T.

UNITED STATES RUBBER COMPANY

1230 Sixth Avenue, Rockefeller Center, New York 20, N. Y. • In Canada: Dominion Rubber Co., Ltd.

Chemical Wood White and Colored Index

No. 183 — 300,000 lbs., white, 25½x30½—180; flat, cut any size, min. width 17 ins., max. width 42 ins., with projecting colored-paper marker between each 100 sheets.

No. 184 — 200,000 lbs., white, 25½x30½—220 and 280; flat, cut 34½x44 ins., with projecting colored-paper marker between each 100 sheets.

Whitaker Paper Co. .....
(66,000 lbs. during any one month) 7.67c

No. 185—100,000 lbs., buff, 25½x30½—220; flat, cut 32½x42 ins., with projecting colored-paper marker between each 100 sheets.

50% Index, White and Colored

No. 189—400,000 lbs., white, 25½x30½—180; flat, cut 24x38, 28x34, 34½x44 and 38x48 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

Barton, Duer & Koch Paper Co. ..
(100,000 lbs. only) 15.47c

No. 190—400,000 lbs., white, 25½x30½—220 and 280; flat, cut 24x38, 28x34, 32½x42, 34½x44 and 38x48 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Barton, Duer & Koch Paper Co. ..
(100,000 lbs. only) 15.47c
Walker, Goulard, Plehn Co. .....
(10,000 lbs only) 15.90c
(20,000 lbs. only) 15.65c
(30,000 lbs. only) 15.50c
(50,000 lbs. only) 15.40c

No. 191—250,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow 25½x30½—220 and 280; flat, cut 24x38, 28x34, 34½x44 and 38x48 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight. 5,000 lbs.

Barton, Duer & Koch Paper Co. .. 16.47c

No. 192—250,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow 25½x30½—180; flat, cut 24x38, 28x34, 34½x44 and 38x48 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, 5,000 lbs.

100% White Index

No. 196—80,000 lbs., 25½x30½—approximately 250; flat, cut 20½x30½ and 34½x44 ins.

R. P. Andrews Paper Co. 27.66c
Paper Corp. of U. S. 27.15c
Barton, Duer & Koch Paper Co. .. 25.25c

Coated Cover, White and Colored

No. 201—120,000 lbs., white, 20x26—120; flat, cut 26½x41, 32x42 and 34x44 ins.; the grain to run lengthwise of the sheet. Min. order, 5,000 lbs.

No. 202—40,000 lbs., India tint and light green; 20x26—100; flat, 26½x41 ins.; min. order, 5,000 lbs.

Antique-Finish Cover, White and Colored

No. 203—80,000 lbs., antique; white, blue, buff, dawn, quaker drab, terra cotta, gray, brown, green, gobelin blue, granite, tea and yellow; flat, 19½x25¼—95, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 5,000 lbs.

R. P. Andrews Paper Co. 8.48c
Whitaker Paper Co. 8.79c

Cloth Lined Cover, White and Colored

No. 204—40,000 lbs., white, brown and quaker drab; 20x26—136; flat, cut 36x38 ins.

50% Laid Cover, Colored

No. 205—50,000 lbs., blue, cream, white, gray and green, 20x26—130; flat, cut 19½x25¼ and 28x41 ins., with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,000 lbs.

R. P. Andrews Paper Co. 13.73c
Whitaker Paper Co. 14.03c

Wood Manila

No. 208—100,000 lbs., 24x36—80 and 100; flat, cut 25x38 and 32x42 ins., with projecting colored-paper marker between each 500 sheets.

Frank Parsons Paper Co. 5.75c

No. 210—40,000 lbs., 24x36—120; rolls, 18-ins. diameter, 4¾, 5¾, and 7½ ins. wide, wound on wooden plugs, 1½-in. hole.

Whitaker Paper Co. .....
(4¾ inch rolls) 5.905c
(5¾ x 7½ inch rolls) 5.66c

Chemical Wood Manila

No. 211—40,000 lbs., 24x36—140 and 160; flat, cut any size. Min. order, one weight, 5,000 lbs.

No. 2 Kraft

No. 217—200,000 lbs., 24x36—80 to 160; flat, cut any size, in wrapped bundles.

R. P. Andrews Paper Co. 4.90c

No. 218—100,000 lbs., 24x36—80 to 160; cut any size, folded (25 sheets per fold) in wrapped bundles.

R. P. Andrews Paper Co. 4.90c

White Gummed

No. 252—600,000 sheets, flat, 22x34 ins.; min. order 25,000 sheets.

25% Blotting, White and Colored

No. 255—40,000 lbs., buff, salmon and moss green; flat, 19x24 ins., 160 lbs., in wrapped bundles; min. order, one color, 2,000 lbs.

R. P. Andrews Paper Co. 10.69c
Stanford Paper Co. .....
(buff and salmon) 11.50c
(moss green) 12.75c
Central Ohio Paper Co. .....
(buff and salmon less than 10,000 lbs.) 12.50c
(buff and salmon 10 to 36,000 lbs.) 12.00c
(buff and salmon 36,000 lbs. and more) 11.50c
(moss green and less than 10,000 lbs.) 13.75c
(moss green 10 to 36,000 lbs.) 13.25c
(moss green 36,000 lbs. or more) 12.75c
Whitaker Paper Co. .....
(10,000 lbs. only) 12.00c

High-Finish Chemical Wood Manila Tag

No. 271—40,000 lbs., 24x36—280; flat, cut any size, min. width 24 ins., max. width 38 ins.

Paper Corp. of U. S. 9.25c

Calendered Tag, Manila and Colored

No. 276—500,000 lbs., manila, 22½x28½—150; rolls, 23¼ and 26½ ins. wide (6-inch fiber cores with metal tips).

Barton, Duer & Koch Paper Co. .. 8.50c

No. 277—30,000 lbs., blue, brown, green, ivory, pink, red, salmon and yellow 22½x28½—150; rolls 23¼ and 26½ ins. wide (6-inch fiber cores with metal tips). Min. order one color, 10,000 lbs.

Barton, Duer & Koch Paper Co. .. 9.50c

Railroad Board, White and Colored

No. 301—100,000 sheets, white; flat, 22x34 ins., 4-ply, each 100 sheets fully banded; min. order 10,000 sheets.

Stanford Paper Co., per M sheets 34.05c
Barton, Duer & Koch Paper Co. .. 34.38c
Old Dominion Paper Co. 33.869c

No. 302—50,000 sheets, white; flat, 22x34 ins., 8-ply, each 100 sheets fully banded; min. order 5,000 sheets.

Stanford Paper Co., per M sheets 48.98c
Barton, Duer & Koch Paper Co. .. 49.02c
Old Dominion Paper Co. 48.737c

No. 305—30,000 sheets, buff, flat, 22x38 ins., 14-ply, each 50 sheets fully banded. Min. order, one color, 5,000 sheets.

Stanford Paper Co., per M sheets 67.92c
Barton, Duer & Koch Paper Co. .. 67.59c
Old Dominion Paper Co. 67.537c

Wood Bristol, Colored

No. 306—250,000 lbs., buff, 22½x28½—150; rolls, 20 ins wide (6-inch iron cores).

Frank Parsons Paper Co. 6.00c

No. 307—50,000 lbs., 22½x28½—150; flat, cut 32x42 ins.

Frank Parsons Co. 6.50c

No. 308—40,000 lbs., mellon, 22½x28½—184; flat, 20x30 ins., in wrapped bundles with projecting colored-paper marker between each 100 sheets.

Barton, Duer & Koch Paper Co. .. 6.79c

No. 309—200,000 lbs., blue, buff, gray, green, melon, pink and yellow; 22½x28½—184; rolls, 20 ins. wide (6-inch iron cores).

Barton, Duer & Koch Paper Co. ..
(minimum quantity per color 10,000 lbs.) 6.40c

Chemical Wood Tan Bristol Board

No. 310—100,000 lbs., 22½x28½—200; flat, cut 19½x28½, 24x36, 25x38, 28x38 and 34x44 ins.

Paper Corp. of U. S. 10.00c

Jute Tan Bristol Board

No. 311—100,000 lbs., 22½x28½—200; flat, cut 19½x28½, 24x36, 25x38, 28x38 and 34x44 ins.

R. P. Andrews Paper Co. 10.25c
Paper Corp. of U. S. 11.50c

United States Postal Card Bristol

No. 325—1,200,000 lbs., 22½x28½—188; rolls, 22 ins. wide, 30 ins. in diameter and 33 ins. wide, 36 ins. in diameter (6-inch iron cores).

R. P. Andrews Paper Co. .....
(50,000 lbs. only) 6.17c
Whitaker Paper Co. .....
(1,800,000 lbs lots 325, 326 and 327) 6.22c

No. 326—1,200,000 lbs., 22½x28½—188; rolls, 22 ins. wide, 30 ins. in diameter and 33 ins. wide, 36 ins. in diameter (6-inch iron cores).

R. P. Andrews Paper Co. .....
(50,000 lbs only) 6.17c
Whitaker Paper Co. .....
(1,800,000 lbs lots 325, 326 and 327) 6.22c

No. 327—1,200,000 lbs., 22½x28½—188; rolls, 22 ins. wide, 30 ins. in diameter, 33 ins. wide and 36 ins. in diameter (6-inch iron cores).

R. P. Andrews Paper Co. .....
(50,000 lbs. only) 6.17c
Whitaker Paper Co. .....
(1,800,000 lbs. lots 325, 326 and 327) 6.22c

News Board

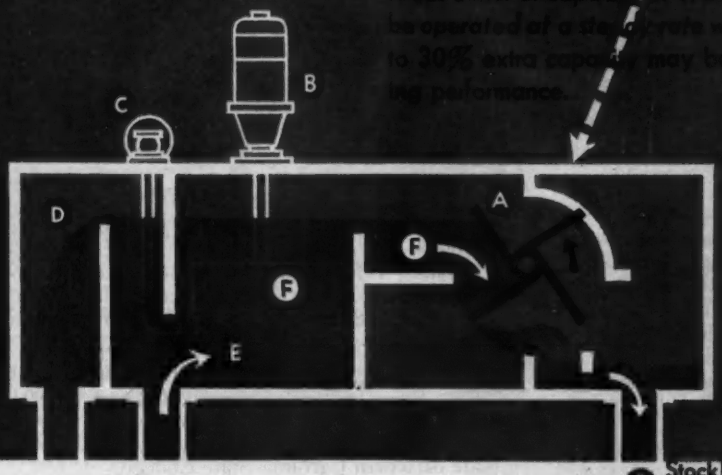
No. 360—500,000 lbs., 26x38—100, flat, cut any size, min. 21x32 ins., max. 40x52½ ins. (to be trimmed square on four sides).

Smooth the flow

WITH AN **Impco Stock Meter**

Gain up to 30% extra capacity

Most pulp and paper making equipment is rated conservatively so that it has a margin of capacity to absorb peak loads either of capacity or of consistency. If a machine can be operated at a steady rate well up towards its peak, up to 30% extra capacity may be obtained without penalizing performance.



A Impco Metering Device
B Consistency Regulator
C Dilution Valve
D Overflow
E Stock of Variable Consistency and Flow
F Stock of Regulated Consistency
G Stock Discharged at Steady Flow, Regulated Consistency at Measured Rate

THE Stock Meter is an adjustable volumetric measuring device which enables you to realize this extra capacity from your equipment. Preceded by a consistency regulator it gives a fixed flow of a regulated consistency and thus uniform tonnage control.

It has already been used:

(1) Ahead of Brown Stock (Black liquor removal) kraft washing systems to maintain uniform operation conditions—*main factor for clean washing with high strength of liquor to the evaporators.*

(2) Ahead of Screen rooms to maintain a steady load on screens—*the most important consideration for pulp cleanliness.*

(3) To govern the rate of stock flow through bleach plants so that chemicals can be properly apportioned—*the first step in getting high brightness with minimum strength loss.*

If you have a mill bottle-neck, consider an Impco Stock Meter to smooth the flow. Write to us for further information.

IMPCO

Improved **PAPER MACHINERY CORPORATION**

NASHUA, NEW HAMPSHIRE

Binder's Board, No. 1 Quality

No. 366—400,000 lbs., flat, to trim 25x30 ins., Nos. 16, 18, 20, 25, 30 and 40.

Mathers-Lamm Paper Co. 4.415c

No. 367—50,000 lbs., 25¾x30¾, Nos. 12 and 20; flat, to trim 34x44 ins.

Binder's Board Best Quality

No. 368—20,000 lbs., flat, to trim 20x30 ins., and 22x28 ins., Nos. 18, 20, 25, 30, 35, 40 and 45. Min. order, 5,000 lbs.

Consolidated Paper Co. 5.87c

Chestnut Cover Board

No. 369—40,000 lbs., flat, to trim 25x30 ins. Nos. 17, 19, 21, 25, 31 and 41.

Mead Sales Co. .....
(caliber 60 pts and up) 4.00c
(caliber 50 pts. and up) 4.375c

What Not Club Formed

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., March 12, 1945—With the idea of forgetting the trials and tribulations that exist these days in the paper industry, a group of mill representatives and paper distributors have formed the What Not Club, and on Friday last celebrated its first birthday with a dinner at Palumbo's. There are no membership dues and no rules or regulations

ORGANIZERS OF THE WHAT NOT CLUB

in the What Not Club—just good fellowship. Present at the first birthday celebration were—front row: Lee Johnson, Atlantic Gummed Paper Corporation; George K. Hooper, president of Hooper Paper and Twine Company; Harry Platt, Denney Tag Company; back row: E. L. Richards, Buffalo Envelope Company; J. R. Howarth, president J. R. Howarth Paper Company, and Fred Brower, Stocken Manufacturing Company. The Club will meet monthly, and J. R. Howarth is chairman of the next monthly meeting.

Joins Butler-Deardon Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

WORCESTER, Mass., March 12, 1945—Frederick K. Vroon has joined the sales staff of the Butler-Deardon Paper Company of this city.

Mr. Vroon was formerly vice-president of the Commonwealth Press and treasurer of the Worcester Lithographic Corporation, which positions he held for fourteen years.

In 1942 he became general manager of the T. Morey & Son, book publishers of Greenfield, Mass. When this firm shut down because of war conditions he joined the Greenfield Tap and Die Corporation taking charge of industrial relations.

He was appointed chairman of the War Production Committee for the plant and was chairman of the Industrial Group C.E.D. for Franklin County.

Crystal Tissue Names Reed

Stanley H. Reed has been appointed assistant sales manager of The Crystal Tissue Company, Middletown, Ohio, to replace W. E. Piper who has resigned. Mr. Reed has been associated with Crystal for several years, during the last seven years in the sales department where he has made a wide acquaintance among the trade.

New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Lewis T. Bevins, chemist, Brown Paper Mill, Inc., Monroe, La. Attended extension courses at Northeast Junior College of Louisiana State University.

Maxwell B. Carter, Jr., student at University of Maine, Orono, Maine.

Alan R. Cook, assistant superintendent, Riegel Paper Corp., Milford, New Jersey, a 1932 graduate of Lafayette College.

John L. Giles, senior technical officer, British Air Commission, Washington 6, D. C., a 1922 graduate of Cambridge University (England).

Martin H. Gurley, Jr., in charge of the Textile and Paper Section, Gustavus J. Esselen, Inc., 857 Boylston street, Boston 16, Mass., a 1927 graduate of Harvard College.

K. Helge Holm, chief chemist, The Terre Haute Paper Company, Terre Haute, Ind. Attended special courses at Oregon State College and University of Minnesota.

Edward C. Molin, technical assistant, Glassine Paper Company, Manayunk, Philadelphia, Pa. Attended St. Joseph's College.

James W. Nelson, chemical engineer, Moore Business Forms, Inc., Pacific Manifolding Book Div., Emeryville 8, Cal., a 1934 graduate of the University of Illinois.

Kenneth E. Pinkerton, plant manager, Filter Materials, Inc., Waupaca, Wis. Attended Lawrence College.

J. Frank Seely, chemical engineer, Union Bag and Paper Corporation, Savannah, Georgia, a 1941 graduate of North Carolina State College.

David B. Snedeker, dyestuff chemist, American Cyanamid Company, Calco Chemical Div., Heller & Merz Dept., 146 West Kinzie street, Chicago, Ill. Attended Rutgers University and Illinois Institute of Technology.

Clifford A. Webb, Jr., chemical engineer, Union Bag and Paper Corporation, Savannah, Georgia, a 1944 graduate of Alabama Polytechnic Institute.

William S. Wilson, Director of Research, Monsanto Chemical Company, Merrimac Div., Everett 49, Mass., a 1902 graduate of Massachusetts Institute of Technology.

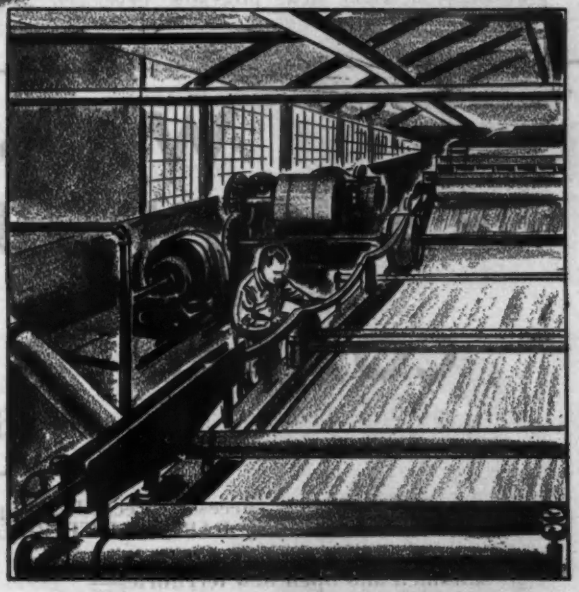
Stauffer Chemical Co. Expands

Stauffer Chemical Company recently announced plans to expand their Hammond, Indiana, sulphuric acid plant to meet accelerated wartime demands and to insure sufficient tonnage for post-war activities. Stauffer officials said that this increase in capacity will require considerably more floor space and a permanent structure is in process of erection and should be completed about the first of July. They added that Stauffer's policy of shipping sulphuric acid in tank cars, drums and carboys to this area will not be interrupted or altered.

Do you know that . . .

AMERICAN AIRLINES INC. UNDER CONTRACT TO THE AIR TRANSPORT COMMAND HAS MADE MORE THAN 4300 TRANSATLANTIC CROSSINGS . . . FOR LUBRICATION OF ITS GREAT FLAGSHIP FLEET, AMERICAN USES SINCLAIR PENNSYLVANIA MOTOR OIL.

CRUDE OIL AND FINISHED PRODUCTS TRANSPORTED DAILY THROUGH THE SINCLAIR PIPELINE SYSTEM WOULD FILL 318,400 55-GALLON DRUMS. THESE, STACKED END ON END WOULD BE 31 TIMES HIGHER THAN MT. EVEREST. SINCLAIR USES OLDEST CRUDES TO MAKE HIGHEST QUALITY LUBRICANTS.



ECONOMICAL MAINTENANCE AND LOW COST LUBRICATION OF ROLLS, CALENDERS, GEAR UNITS, CHAIN DRIVES AND BEARINGS ARE PROVIDED BY SINCLAIR RUBILENE OILS, OPALINE GEAR LUBRICANTS AND BEARING GREASES . . . EFFICIENT ENGINE LUBRICATION IS ASSURED BY SINCLAIR STEAM CYLINDER AND VALVE OILS.

SINCLAIR IS EQUIPPED TO SERVE YOU BETTER!

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

To Serve On Patent Committee

B. R. Newcomb, president and general manager, John Waldron Corporation of New Brunswick, N. J., was named today to serve on the committee on patents of the National Association of Manufacturers.

Mr. Newcomb's acceptance was announced in New York by R. J. Dearborn, president of the Texaco Development Corporation and chairman of the NAM Patents Group.

The NAM Committee this year will continue its nationwide efforts to encourage invention and scientific progress through strengthening and improvement of the patent system. Definite legislative recommendations already have been made, including one to combat illegal cartels and trusts through the recording of patent contracts in the U. S. Patent Office. This particular recommendation will facilitate government investigation of the practices involved and enable quick decision as to whether they are contrary to public interest or in violation of the anti-trust laws or in conflict to international policy.

Wants More Funds for Lab. Work

Representative Angell, Oregon Republican, last week asked the House Appropriations Committee to recommend an increase of $1,500,000 in the annual appropriation for the Forest Products Laboratory at Madison, Wis., to provide for expanding experiments in wood utilization. He also asked $50,000 for the forestry pilot plant at Portland, Ore., to carry to a practical conclusion new processes developed at Madison.

Saving Handling Labor

The new "E-Z" Portable Loader, manufactured by The Noble & Wood Machine Company, Hoosick Falls, N. Y., has been designed to conserve time and labor in the loading of pulpwood, barrels, drums, bales, etc. on trucks, freight cars, barges, etc. This loader has a lifting capacity of 1000 pounds and the manufacturers states that it will load approximately 5½ cords of 4½ inch wood, averaging 16 inches in diameter, on a truck in 30 minutes. The loader is powered with a standard make of 5 h.p. gasoline engine and the fork arm is equipped with an ingenious snubbing device which lowers it without jolt, and the fork remains in the down position for a definite interval to faciltate loadng.

H. D. Wells Elected President

GLENS FALLS, N. Y., March 12, 1945—The annual meeting of the American Paper Machinery and Engineering Works, Inc., was held here this week at which Harold D. Wells was elected president. Other officers chosen included H. Donald Wells, vice president, and Mrs. Viola Wells, secretary and treasurer.

Technicarbon Co. Incorporates

BOSTON, Mass., March 12, 1945 — Technicarbon Company, Inc., 85 Sargent street, Holyoke, Mass., has been incorporated to buy and sell paper, paper products, etc., with a capital stock of 1000 common shares having no par value. Robert Hano is president; Edward Hano, treasurer, and Alfred A. Lent, clerk.

WANTED
BRANCH HOUSE MANAGER
In Organization of one of the Largest
COARSE PAPER HOUSES
In the Middle West

IF **you have a successful record of experience in the industrial as well as the retail phase of the COARSE PAPER DISTRIBUTING BUSINESS—**

IF **you are SALES-MINDED and have the ability to manage, train and develop new salesmen and open new territories—**

IF **you really want a life-time job with this successful progressive organization which has enjoyed a reputation of handling only quality products in large volume for more than half a century—**

IF **you think you are capable of justifying the liberal compensation that goes with the position we offer—**

Send us full information telling in detail what you have accomplished for others, stating when you would be available and giving all pertinent details.

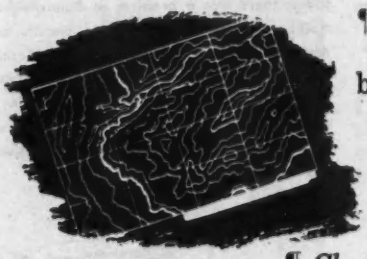
Our people know of this advertisement.
Your application will be treated in confidence.

Address Box 45-169 care Paper Trade Journal M-15

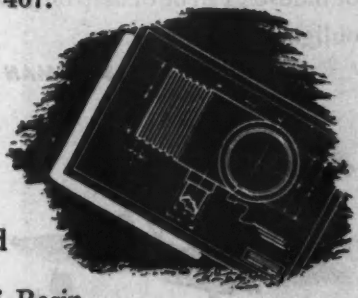
WHEREVER WET STRENGTH COUNTS

UFORMITE 467

UFORMITE 467, a unique urea formaldehyde resin for beater addition, affords a simple, economical solution to wet strength problems.

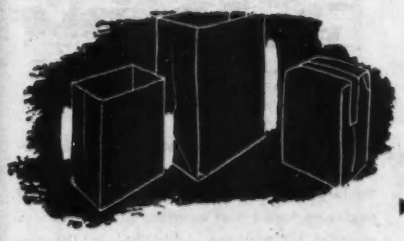


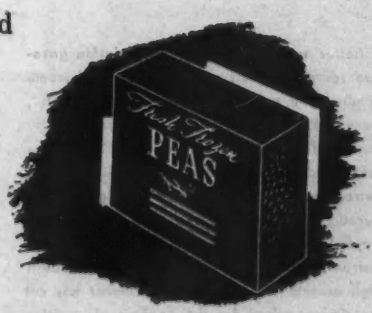
¶ Paper toweling, map paper, bag and wrapping paper, blue-print paper, food wrapping—these are but a few of the papers that can be improved with UFORMITE 467.



¶ *Check each of these nine advantages:*

Greater Wet Strength ▸ Improved Dry Properties ▸ Low Cost ▸ Ease of Application ▸ Beater or Tub Addition ▸ Improved Effectiveness and Uniformity of Rosin Sizing ▸ Infinitely Water Dilutable ▸ No Special Catalyst Required ▸ No Color, Odor, Taste.





UFORMITE *is a trade-mark, Reg. U. S. Pat. Off.*

---

9 awards to The Resinous Products & Chemical Company and its associated firms, Rohm & Haas Company and Charles Lennig & Company.

Represented by Cia. Rohm y Haas, S.R.L., Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities.

THE RESINOUS PRODUCTS & CHEMICAL COMPANY

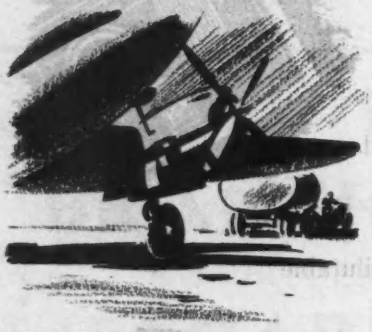
WASHINGTON SQUARE, PHILADELPHIA, PA.

For far reaching advancements in instrumentation... consult BECKMAN!

A better method of controlling electronic circuits. When Radar and other directional and depth-finding devices became of critical importance, there was a problem of accurately controlling the complex electronic circuits used. Another Beckman development—the *Beckman Helipot*, a new type potentiometer that combines both wide range and high sensitivity in one extremely compact unit—proved to be the solution and is now being supplied in large quantities to fill top-priority military needs.

THE BECKMAN research staff has had years of experience in developing new, better, more accurate methods of controlling modern production processes through advanced instrumentation. Perhaps this widespread experience in solving instrumentation and control problems in many types of industry can be of help on *your* problem. Why not contact us? No obligation, of course.

SOME OF THE BECKMAN DEVELOPMENTS INCLUDE...



A better method of controlling aviation gasoline refining. When aviation gasoline became number one on the war production "musts", ways had to be devised to speed up and simplify control of processes in the giant new 100 octane refineries. Working in cooperation with leading petroleum scientists, Beckman engineers produced in quantity a new routine Infrared Spectrophotometer which today is the key control instrument in virtually every one of the modern high octane refineries. This instrument has cut the time required for the analysis of complex hydrocarbon mixtures from many *hours* to only a few *minutes*, greatly stepping up the efficiency and economy of war-paced refinery processes.

A better method of controlling Toluene production processes. When Toluene (basic for TNT) became another war essential, new processes were developed to produce this product on a large scale from petroleum. Again there was a critical control problem, and again the Beckman organization provided the answer—this time with the *Beckman Quartz Spectrophotometer*.

A better method of controlling Penicillin production. In developing a new secret process for the large-scale production of Penicillin, chemical engineers found that accurate pH control was essential for optimum yield. Knowing the pioneering accomplishments of the Beckman staff in advanced instrumentation, they brought their problem to the Beckman organization. Result—Beckman engineers, from their extensive background in pH, developed a special type of flow chamber that is now playing a major role in today's stepped-up Penicillin production.

THESE ARE ONLY TYPICAL OF *MANY* BECKMAN DEVELOPMENTS in instrumentation and control methods for chemical... mining... food... petroleum... vitamin... paper and other production processes. This vast fund of "know-how" for applying science to the control of production processes is at your service. Write, outlining your problem.

BECKMAN

BECKMAN INSTRUMENTS

NATIONAL TECHNICAL LABORATORIES • SOUTH PASADENA 16, CAL.

STRUMENTS CONTROL MODERN INDUSTRIES

WALWORTH
valves and fittings

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

SINCE 1842 Walworth has continuously manufactured valves and fittings for every need. Its complete line of products includes:

STEEL VALVES: Made in all styles and sizes for pressures up to 5000 psi OWG — 1500 psi Steam at 950F.

BRONZE VALVES: Gate, Globe, Angle and Check types for services up to 3000 psi OWG — 300 psi Steam at 500F.

LUBRICATED PLUG VALVES: Plain and ball-bearing types, ½" to 24", for pressures from 125 to 5000 psi and vacuum.

FITTINGS: A complete line in steel, bronze, and iron. Screwed, flanged, and welding ends.

WALSEAL* VALVES AND FITTINGS: For making threadless Silbraz* joints on copper or brass pipe or tubing. * Reg. Trade Marks

PIPE WRENCHES: Three types—Walco, Walworth Genuine Stillson, and Parmelee—each one strong, simple and dependable.

12 AWARDS TO 4 PLANTS

For a detailed description of Walworth products, write on your company letterhead for free copy of Catalog 42. Address the Walworth Company, 60 East 42nd St., New York 17, New York.

Kalamazoo Discusses White Water

The Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry met at the Columbia Hotel, Kalamazoo, Mich., on Thursday, March 1, 1945. The Utilization of Papermill White Water was the subject of the evening. H. A. Morrison of Oliver United Filters, Inc., gave an illustrated talk showing the adaptability of Oliver filters for clarifying various types of white water. He stressed the importance of simplicity of layout design and at the same time providing for future expansion and increased production. There are many steps that can be taken to minimize fresh water usage through larger reuse of white water.

P. M. Loddengaard of the Bulkley, Dunton Pulp Company described the Sveen-Pederson save-all and its operation. He pointed out that the installation of excess-save-all capacity encourages the use of fresh water and tends to defeat the purpose of the save-all installation and requires having considerable water clarified which could be reused without clarification.

Following these two talks the general discussion covered the use of white water in wire showers, extent of solids permissible in such water, types of showers in use with white water, build-up of chemical residues in closed systems, control of microbiological growths, foaming difficulties in white water use. It was the opinion of those present that there is no known economic use for deinking washer wastes and that a completely closed white water system is not practical because of the poor sizing obtained with the resultant chemical residual build-up in the system.

Those present included: D. D. Bachelder, Ray L. Barton, Harry C. Bradford, Art Coffin, A. W. Cole, C. T. Colgren, C. F. Davis, Frank B. Eilers, Bruce P. Ellen, D. Robert Erickson, L. E. Fitzgerald, Merton S. Fogarty, B. E. Freeman, R. C. Germanson, Fr. R. Hamilton, H. W. Hartman, J. A. Heenan, J. R. Hubbard, L. H. LaLiberte, P. M. Loddengaard, Hoke Martin, R. T. Mashburn, D. W. McArthur, C. R. McKee, H. A. Morrison, Ira P. Nicole, A. B. Perbik, Lloyd J. Rogers, A. L. Sherwood, Dwight L. Stoeker, E. B. Taylor, Wm. Thompson, W. R. Tobin, R. Tutt, Jr., Joe Waber, Merle R. Wilkins, James A. Wise, and A. E. Woollam.

Fiber Drum Committee Meets

WASHINGTON, D. C., March 14, 1945 — Severe weather, the freight embargo and fuel shortages have hampered the delivery of paper board for the production of fiber drums recently, but production conditions are improving, members of the Fiber Drum Industry Advisory Committee said at their recent meeting, the War Production Board reported today.

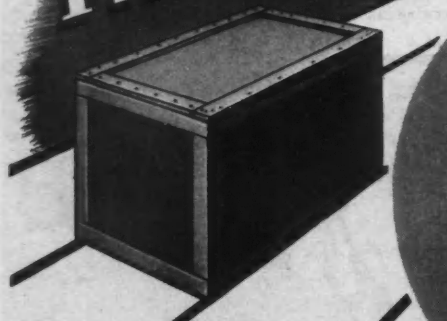
In a discussion of manpower problems, committee members were advised by WPB officials to make their difficulties known to George W. Speakes, Labor Relations Officer, Containers Division, WPB, Washington 25, D. C.

Second-quarter allocations of paper board for fiber drums will not be made for about two weeks, WPB officials told the committee, and any action to revise Limitation Order L-337, governing fiber shipping drums, will be contingent on the allocations. If second-quarter allocations of paper board are reduced from first-quarter levels, further restrictions under Order L-337 may be necessary, WPB representatives said.

Because of the continued tight supply situation in paper board, fiber drum users are urged by WPB to practice the utmost conservation and to re-use drums wherever possible.

Proposed specifications on fiber drums for domestic shipment for the Army and Navy were discussed and their adoption was recommended by the industry advisory committee.

HOW TO PACKAGE A *Masterpiece*



Inside this box is an Orr felt, clean and flawless. It's no ordinary box for it is free from splinters . . . it is strong . . . and it is so constructed that no protruding nails can damage the valuable contents.

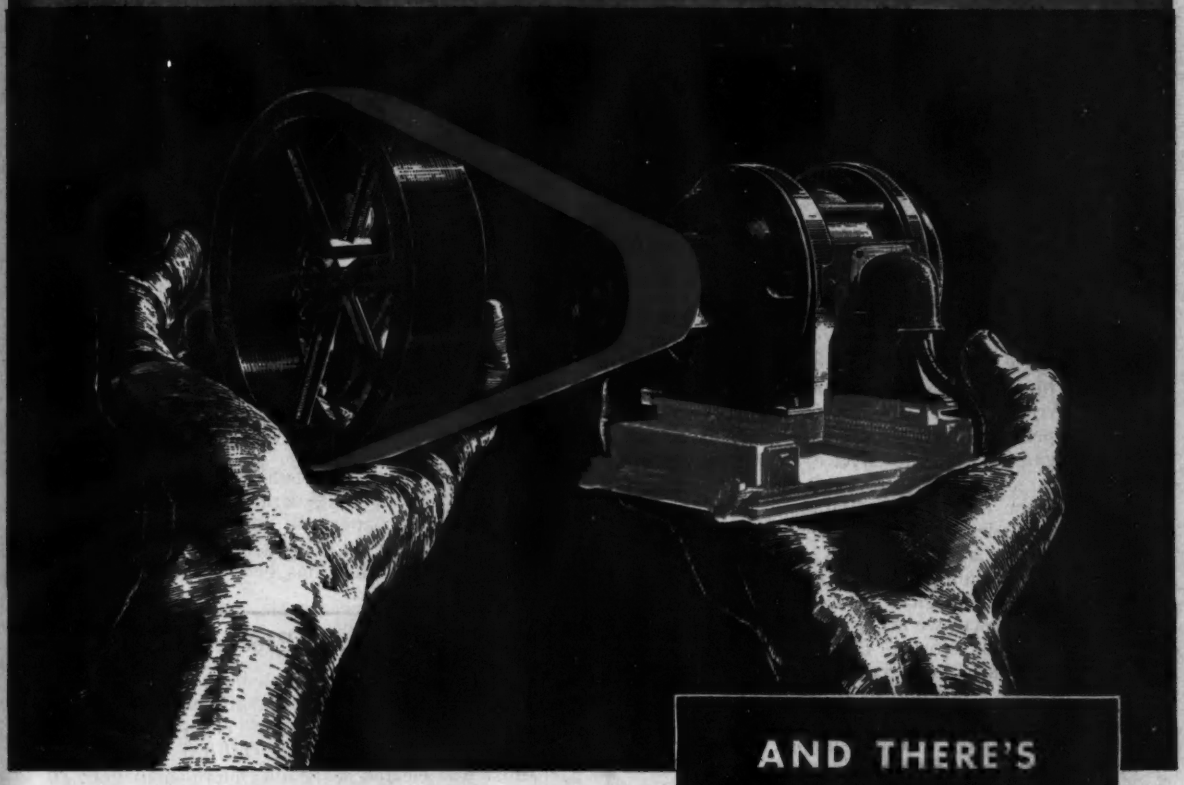
At Orr we take great pride in the "little things" such as correct packaging, storing, mothproofing, etc. And we feel that our interest in Orr felts rightly extends into your own mill.

That's why we have instructed our representatives to be of the greatest possible service to you. The next time one calls, allow him to examine your felt handling methods and make any suggestions.

ORR FELTS

THE ORR FELT & BLANKET CO.
PIQUA, OHIO

HERE'S THE ONLY BELT DRIVE THAT DOESN'T DEPEND ON TENSION!



AND THERE'S ONLY ONE BELT FOR THAT DRIVE

The high but often unsuspected costs of over-tensioned or under-tensioned belts *can* be eliminated. With the Flat Leather Automatic Tension drive, there is no need to *over-stress* tension to make sure of handling peak loads . . . no need for frequent maintenance to correct slippage due to *under-stressed* tension.

It is the action of the pivoted base that keeps the drive delivering — not the initial tension on the belt. Tension is always right, automatically. When the load is heavy, the pivoted base *tightens* the belt. When the load is light, the pivoted base *relaxes* the belt. Belt and bearings work hard *only* when the load is heavy.

There is no pulley realignment problem. If the base ever has to be adjusted, it can be done while the motor is running, and alignment is not critical.

Save maintenance . . . on belts, on bearings. Let the pivoted base do your worrying for you. Install the Flat Leather Automatic Tension drive—with "Research" Leather Belting.

Graton & Knight's "Research" Belt has the ideal qualities for service with pivoted bases:

- Highest coefficient of friction and flexibility so that it hugs the small pulley with minimum slip, thus reducing tension needed.
- Least stretch, guaranteeing long, uninterrupted performance.

A "Research" Belt on Flat Leather Automatic Tension drive will outlast a rubber V-belt on a corresponding drive by 2 to 1! Write Graton & Knight Company, 333 Franklin St., Worcester 4, Mass., for new, free Belting Manual.

GRATON AND KNIGHT

Research Leather Belting

from Graton & Knight's complete line . . . manufactured under one control from green hide to finished product. Branches and distributors everywhere. Look under "Graton & Knight" in "Belting" section of Classified Telephone Directory or THOMAS' REGISTER.

G.P.O. Opens St. Louis Office

The Government Printing Office has appointed a representative to supervise contract printing in the St. Louis area for the government and to act as liaison between St. Louis printers and lithographers and the Government Printing Office in Washington. Paul P. Tice, who was appointed to fill the position, according to an announcement by the Public Printer, A. E. Giegengack, took over his new duties on March 5.

Prior to his appointment as St. Louis representative, Mr. Tice was a member of the Chicago warehouse staff of the G.P.O. He has worked for Uncle Sam's big print shop since entering his apprenticeship there seventeen years ago.

The Public Printer's decision to appoint a representative at St. Louis results from a recent visit to that city at which time he accepted an offer of graphic arts leaders there to increase production of war printing.

"St. Louis printers," said the Public Printer, "have always cooperated fully with the Government and have already produced some of our most important jobs. The establishment of our warehouses adjacent to the Army's depots and to Navy ports, with technical supervision and liaison as well as large paper stocks available, had the effect of concentrating much of the war-connected printing at those points. Now, however, the manpower situation in our warehouse cities has made it necessary for us to look also to other sources, and St. Louis, with its fine plants, large modern equipment and transportation facilities appears to be the logical place.

"For the present we are not planning to have either a large staff or storage facilities for paper. Contractors who are under continuing contracts will be asked to take from one to three months' supply of paper into their plants. For other jobs which are nonrecurrent paper will be shipped direct from the mill or from our Chicago warehouse.

"I have been asked to estimate the volume of work which will be placed in St. Louis under the new arrangement. Naturally this will depend on the flow of work from the departments and its destination, neither of which can be controlled by the G.P.O."

The Public Printer went on to say that he is confident of the continued cooperation of the graphic arts industry in St. Louis. He believes that the production of government printing will be expedited by having all questions cleared through the new office, saving in many cases the entire time consumed by routing everything to Washington and then waiting for a decision.

The G.P.O.'s St. Louis representative has quarters in the Paul Brown Building, 818 Olive street, and is now available for consultation with printers in the area.

J. M. Tuttle Goes To Pittsburgh

James M. Tuttle has joined the staff of engineers attached to the Pittsburgh office of the Foxboro Company, at 5151 Baum Boulevard, Pittsburgh, 24, Pa.

Mr. Tuttle has a background of experience which will be particularly useful in serving the diversified industries of the Pittsburgh territory. A graduate of M.I.T., he spent several years as an engineer with an industrial construction company, and later conducted his own business as a manufacturers' representative and engineering consultant.

Sees Paper Outlook Improved

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., March 12, 1945—Continued heavy demand for all types of paper featured the local market last week, with supplies very limited and both manufacturers and jobbers at their wits end to parcel out the deliveries fairly The improved outlook in Europe has cheered the trade somewhat, but it is felt here that it likely will be six months after the European stage has been cleared before there will be any noticeable improvement in paper supplies. However, with the close of hostilities in that section, the paper manufacturers in Indiana are hoping for some improvement in the labor situation.

Newsprint demand continued heavy, with quotas being purchased and advertising being turned away. Local magazine and book publishers are in much the same predicament the newspaper publishers are.

The outlook for building paper and roofing is somewhat better now than it was a year ago. Government officials have given the go sign for the construction of a number of medium priced homes and it is expected a good volume of repair and remodeling work will add to the volume. Stocks of roofing paper and building paper are fairly well balanced in local warehouses, though inventories are comparatively low.

Demand for paper stock continued very heavy last week. The public generally is responding now to appeals to save paper and each city-wide collection, not only here, but in other larger cities, shows more tonnage received than has been usual. Rag demand also has been heavy.

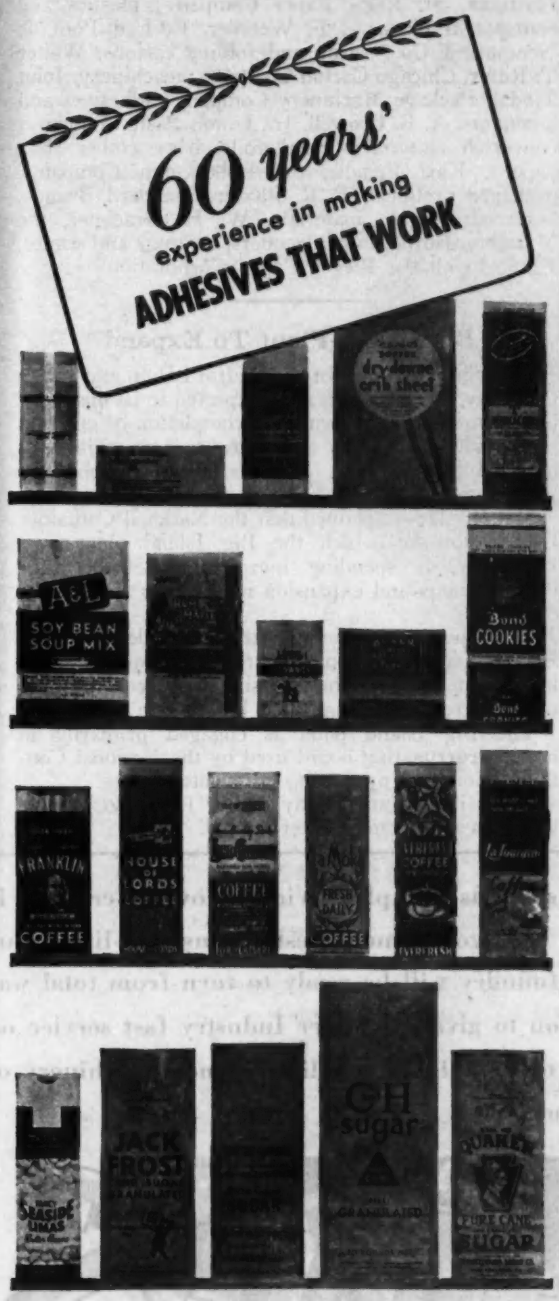
W. C. Leonhard Elected President

William C. Leonhard has been elected president of the Paterson Parchment Paper Company of Bristol, Pa. Richard T. Anderson was elected vice-president and general manager; J. R. Dufford, formerly chief chemist was elected assistant general manager; H. J. Kendall formerly general auditor is now assistant treasurer and director. W. J. Gray, general manager of the Paterson Pacific Parchment Company of San Francisco has been elected a director of the parent company in Bristol. The full list is as follows: W. C. Leonhard, president; R. T. Anderson, vice-president and general manager; E. R. Leonhard, vice-president in charge of sales; J. T. Leonhard, treasurer; Gilbert Megargee, secretary; J. R. Dufford, assistant general manager; H. J. Kendall, assistant treasurer; directors, G. C. Mayer, C. H. Leonhard, G. R. Leonhard, T. B. Megargee, M. F. Glessner, W. J. Gray.

Frank S. Murphy Dead

Frank S. Murphy, aged 59, Appleton, Wis., died suddenly February 26, at his home of a heart attack. He was associated with Lockport Felt Company, Newfane, N. Y., for 25 years. He was a member of First Congregational church, Appleton; Waverly Masonic lodge; Appleton Chapter, Royal Arch; Appleton Commandery, and Tripoli Shrine of Milwaukee; Elks and Knights of Pythias. Survivors include the widow and two young sons; a brother, a sister, and one grandchild.

Funeral services were conducted March 1, at the Wichmann Funeral home, Appleton, by the Rev. Dascomb E. Forbush, pastor of the First Congregational church, and burial was in Riverside cemetery, Appleton.



"steps up production... saves waste... service is outstanding"

"When you have been manufacturing famous paper bags for half a century—like the bags shown here—you have found out something about how they are made. Because each job is designed for a special purpose, we must rely on the best formulated adhesives available. That is the first of two good reasons why for more than twenty years we have been using Arabol adhesives. Your Seam Gum and Bottom Paste give excellent performance in both stepping-up production and saving waste. The second good reason is that Arabol service is outstanding."—*statement by Gordon H. Friend, V. P. of Thomas M. Royal Co., a Philadelphia concern celebrating fifty years in the manufacture of paper bags.*

* * *

Producing the *right* adhesive for *each specific* converting, packaging or allied problem is Arabol's constant aim. Now in our 60th year, we are the oldest large manufacturer of industrial adhesives. With this experienced background, you are assured of sound solutions to your new problems. We invite the opportunity to demonstrate our ability to service you See the Arabol Representative when he calls He knows adhesives.

THE ARABOL MANUFACTURING CO.

Executive Offices: 110 East 42nd St., New York 17, N. Y.

Offices and Factories:

BROOKLYN · CHICAGO · SAN FRANCISCO

Branches in Principal Cities

Adhesives? . . . ARABOL!

SIXTY YEARS OF PIONEERING

Packaging Institute to Advise

Announcement that the Quartermaster Corps has asked the technical committee of Packaging Institute to serve as the industry advisory committee for its subsistence and development laboratory, was made by Walton D. Lynch, president of the Institute, following a meeting of the board of directors, held on February 28, in New York.

The request for the services of the committee was made by Major Robert R. Melson, of the subsistence and development laboratory, Chicago Quartermaster Depot. Charles A. Southwick, Jr., chairman of the technical committee, reported that the functioning of the committee, and method of operation had been agreed upon, and that work had already been started on packaging projects submitted by the Quartermaster Corps.

The directors approved this war-time service by the Institute, and the recognition given the technical committee by the Quartermaster Corps, in utilizing its services.

The committee consists of twelve members, including the chairman. Each member covers a particular group of package forms or a phase of the packaging industry, and each member has a sub-committee of five other people, selected to broaden the base of the committee work; making a total of 67 in all.

Following is the membership of the technical committee: Chairman, Charles A. Southwick, Jr., Shellmar Products Company; Vice Chairman, F. S. Leinbach, Riegel Paper Corporation. Directors of Sub-committees: Rigid metal packages and fiber cans, Roger V. Wilson, Continental Can Company; glass containers and closures, H. A. Barnby, Owens-Illinois Glass Company; shipping bags, waterproof bags, Carl Hartman, St. Regis Paper Company; plastics and transparent films, A. F. Wendler, E. I. duPont de Nemours & Co.; set-up and folding cartons, Walter T. Ritter, Chicago Carton Company; machinery, John Tindal, Package Machinery Company; adhesives and laminants, A. B. Crowell, Jr., Union Paste Company; converted materials, metal foils, bags (other than paper), Karl Prindle, the Dobeckmun Company; packaged products, T. R. Baxter, Standard Brands, Inc.; paper base materials, W. H. Graebner, the Marathon Corporation; lacquers, coatings and waxes, F. S. Leinbach, Riegel Paper Corporation.

Big Island Plant To Expand

Paper board output of the Bedford Pulp and Paper Company, Big Island, Va., is expected to be increased by 50 tons a day following the completion of enlargements now under way at the plant, it was disclosed last week by W. H. Brydges, vice-president and general manager.

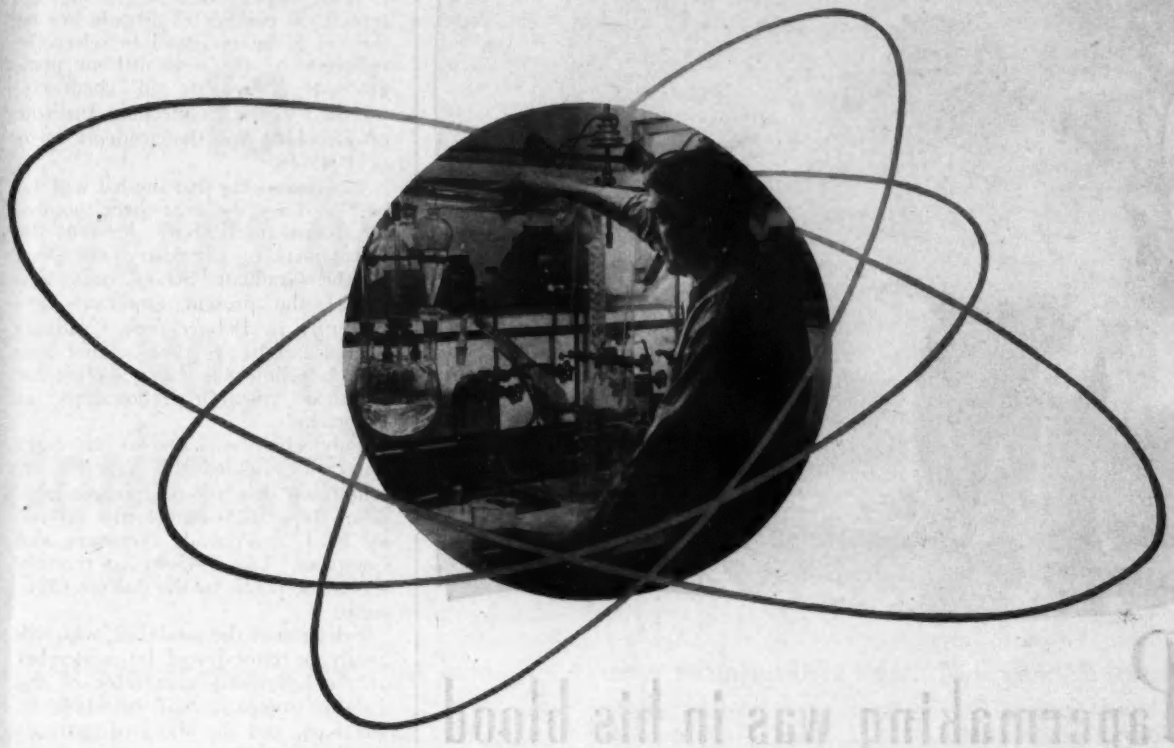
Mr. Brydges explained that the National Container Corporation, of which the Big Island plant is a subsidiary, is spending more than $500,000 for improvements and expansion in order to step up the output.

A temporary housing shortage has developed in Big Island, due to approximately 150 workers being brought in to the town to assist in the construction, not expected to be completed before late in the fall.

The Big Island plant is engaged primarily in making corrugating board used by the National Container Corp., in processing corrugated boxes.

Work is also under way in Big Island to provide the town with a new water supply.

Just as soon as complete Victory over Germany is achieved and government restrictions are lifted our modern foundry will be ready to turn from total war production to give the Paper Industry fast service on castings of the highest quality for new machinery or for replacements.
CASTINGS
THE APPLETON MACHINE COMPANY
APPLETON · WISCONSIN



Widening Circles of Service

Results of Monsanto research in plasticizers are widening circles of service to wartime industry. Such work goes on constantly . . . developing plasticizers to meet special requirements . . . pointing out ways to use available products in place of critical materials.

Beyond wartime accomplishments, there is another circle of service . . . the circle of usefulness these products will have in the days of peace to come. Many developments in plasticizers for war industries will contribute to the *easier* production of *better* products for civilian markets in the days ahead.

We shall do our best to meet your needs from our complete line of plasticizers, if your products are going to speed the day of victory. And we shall be happy to lend a hand in your research to develop products that will help hasten the dawn of peace.

MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle, Montreal, Toronto.

MONSANTO CHEMICALS

SERVING INDUSTRY...WHICH SERVES MANKIND

HISTORICAL HIGHLIGHTS OF PAPERMAKING NO. 11

Papermaking was in his blood

William Rittenhouse, papermaker, left Amsterdam in 1688 and came to America to seek his fortune.

Within two years he had built his own mill near Germantown, Pennsylvania, the first paper mill in America. History records it as "built of logs, the building extending over an undershot water-wheel, there being no dam or race."

Life in the colonies was not easy for these paper pioneers. In 1700, high water swept away William Rittenhouse's mill. But papermaking was in his blood. With the aid of his son Claus, he built a second mill which was in operation in 1702.

And from that day until this, the name of Rittenhouse has been prominent in papermaking.

☆ ☆ ☆ ☆

Like the Rittenhouse's we, at Cheney Bigelow, have been serving the paper industry for many years. Over 100 years of experience goes into the making of our Fourdrinier Wires, Dandy Rolls, Cylinders and other supplies for the paper industry. During this national emergency, we have continued to serve the paper industry. And we have also served our country — to such an extent that a star has been added to our Army-Navy "E."

CHENEY BIGELOW

Fourdrinier Wires • • Dandys • • Cylinders • • Wire Cloth

CHENEY BIGELOW WIRE WORKS • 417 LIBERTY STREET • SPRINGFIELD, MASS.

Fellowship in Chemistry

With applications still being accepted, 30 candidates already are on the list to be reviewed to select the recipient of the new duPont postgraduate fellowship in chemistry, awarded to the Polytechnic Institute of Brooklyn for the academic year of 1945-46.

In announcing that the list will not be closed for the next three months, Dr. Raymond E. Kirk, head of the Department of Chemistry and Dean of the Graduate School, said that 20 of the present applicants are currently in Polytechnic's Graduate School and 10 are chemists not now at Polytechnic who have applied for chemical research fellowships at Polytechnic.

Polytechnic was one of the eight universities added this year to the fellowship list of 35 postgraduate fellowships at 29 universities offered by E. I. duPont de Nemours and Company. The 1945-46 list recently was made public by the duPont Company.

Selection of the candidate, who will finally be interviewed by a member of the fellowship committee of the duPont Company, will be made by Dr. Kirk and the six professors of the department.

The new fellowship, which includes tuition paid by the duPont Company plus a $1,000 stipend, will be awarded for the 1945 fall term.

The duPont fellowship in chemistry becomes the seventh Polytechnic fellowship in this field sponsored by industrial organizations. Polytechnic, itself, sponsors three teaching fellowships in chemistry and several in research in chemistry.

Research in science and engineering at the Polytechnic Institute is conducted in three general ways—in specific assignments by staff members under direct budgetary support, in investigations undertaken for graduate and undergraduate theses, and in individual studies carried on by many members of the faculty.

Boston Paper Men to Meet

The annual meeting and fifty-ninth anniversary banquet of the Boston Paper Trade Association are to be held March 21 at the Parker House. John Booth, the speaker, will describe what goes on "Behind the Scenes with Magicians." Mr. Booth takes his audience behind the footlights, revealing the problems, adventures, and famous people met by magicians. Who, how, and when does the magician fool you? Psychology and philosophy are skilfully woven into this presentation.

13 YEARS OLD AND STILL GOING STRONG

SOME people seem to think that automatic control of pulp digesting is still an experiment. But the fact is Taylor installed what was probably the first practical and successful control system on a sulphite pulp digester back in 1932. And here's what the plant superintendent says about it:

"The original installation has given excellent satisfaction and service. We have had no trouble with strainers plugging or with digesters not blowing clean . . . (It) practically eliminates the human element from the control of two very important variables—temperature and pressure . . . and gives more uniform results than any method of control of which I know."

Low maintenance cost. Now after 13 years of operation this set-up is still going strong! Maintenance costs have been less than $100 which covered a replacement tube system and a few clock parts. This company thought so much of it, they installed an additional unit in 1942.

Soda and Sulphate systems also proved practical. The same principles also apply to both soda and sulphate. In 1937, we worked out two automatic control systems for *soda pulp digesters*. And in 1939, we developed an automatic set-up for digesters producing *sulphate pulp*. All have given excellent service and more uniform production than was ever possible with manual control.

Too good to be true? Not on your life! Taylor has an automatic control system that will fit most of the important operating conditions in every paper mill! Call your Taylor Field Engineer! Or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.*

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BUY MORE WAR BONDS—AND KEEP 'EM

PAPER
TRADE JOURNAL
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Henry J. Berger, Editor

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

Empire State Section. Technical Association of the Pulp and Paper Industry—Second Thursday of each month at the Woodruff Hotel, Watertown, N. Y.

Chicago Professional Paper Group. Third Monday of each month except July and August at Chicago Bar Association, Chicago, Ill.

REHIRING VETERANS

With more than thirty thousand jobs reported available in the paper industry in the post-war period, it appears almost certain that all who are able and want to return to their former employment can do so. Opinion within the paper industry, as well as in most other industries, is strongly in favor of extending every possible opportunity for rehiring old and providing new workers with good paying jobs. The management of many mills have been studying this employment problem for some time. Some concerns have not only completed plans for absorbing service men into their plants but many have already placed war veterans on their payrolls.

Providing jobs for veterans is a responsibility which we all recognize as one of our most serious obligations in building a better post-war world, states the foreword in the booklet, "Rehiring Your Company's Veterans," published last month by The Research Institute of America, Inc., 292 Madison avenue, New York 17, N. Y. This organization functions as a liaison between government and industry, rendering advice and counsel to its more than 30,000 members among professional and business firms and government agencies and bureaus. Full employment, the booklet states, will not be provided by legislation. Jobs are provided by business, industrial and agricultural activity. No one person or group of persons can wave a pen and create adequate jobs. They are created largely by those who have the ideas, the materials and the selling ability to bring about an exchange for people's dollars. And, to a great extent, that exchange must be stimulated by the individual employer. On him rests a large share of the responsibility of speeding up peacetime commerce by creating markets, stimulating demands and thereby providing jobs.

The booklet discusses the most important steps in the reemployment of returning service men, management's obligations under the law, where to get help in retraining veterans, the meaning of "changed circumstances," solving seniority questions, unions and reemployment, planning a personnel policy, steps in rehiring the veteran, handling the disabled veteran, how to keep key employees, local board Memorandum 190-A and excerpt from the Selective Service Act. When the veteran comes back, the booklet points out, the pressure to get old jobs back will mount sharply. "It is safe to assume that a substantial majority of your old employees will want to work for your company again. You will not be far wrong in your preliminary estimates if you figure that at least six out of ten employees will be coming back to your company if they haven't been mustered out before the war ends. This estimate takes into account both the government's education program for veterans and the loan provisions of the G. I. Bill of Rights."

Recommending that employers should formulate their policies of rehiring veterans now, the booklet states in part: "Don't put off your planning for veteran rehiring. Even though months may pass before the war's end and the start of large-scale demobilization, the experience gained in advance can be usefully applied to the bigger problem. . . . Of necessity your first move in rehiring the veteran is to develop a clear, concrete, continuing program, designed to cover every phase of your obligations to returning servicemen, to present employees and to your company as a whole." In reference to the "changed circumstances" clause, the booklet points out that, Selective Service officials construe this section of the Act liberally in order to give veterans the maximum protection. They have held that (a) every reasonable doubt must be resolved in favor of the veteran; (b) the Act commands this kind of interpretation since it was designed to "strengthen the common defense" as well as to maintain morale among the Armed Forces; (c) the sense of the term is clear to those who act in good faith.

On the point of seniority rights the booklet emphasizes the need to watch seniority tables. "Selective Service's rulings on veterans' seniority make it necessary for you to think not only of your returning serviceman's future with the company but the future of your present employees. You are under an obligation to make room for the qualified veteran even if that means 'bumping' a worker who has been with the firm for years. You must start thinking now in terms of the adjustments you are going to make for these senior workers when veterans with lesser seniority seek reemployment. In addition, you must review the seniority provisions in your union contract or seek to change them to gain the flexibility you will need to keep employees you can't afford to let go. . . . Many companies have found it helpful to install a new job revaluation program to reflect wartime changes in process, product and personnel. Any such job revaluation should be pointed particularly toward uncovering occupations that can be adapted to veterans who are disabled or who require extra training. . . . Prepare in advance to bring your supervisory staff

up to date on the 'on-the-job training' methods, so that they can familiarize veterans with new developments in machinery, materials, and methods that have taken place since they left."

Directing attention to the fact that the foreman is important, the booklet gives the following check list of what foremen should know about rehiring veterans: (1) What constitutes the seniority unit—and why. (2) The need for accurate seniority records. (3) The need to treat veterans as a normal person. (4) Careful job analysis with special emphasis on job content as an aid in placing the veteran in proper post. (5) Cooperation with shop steward in rehiring and placing the veteran. (6) Need for complete records of employee performance. (7) Familiarity with policy on (a) transfers, (b) upgrading, (c) layoff, (d) termination pay. (8) The need to report abnormal symptoms to personnel office immediately. (9) The need to suggest rearrangement in work stations or jobs to make room for disabled veterans.

Brookville Plant Sold

INDIANAPOLIS, Ind., March 12, 1945—The William Felt and Paper Company, Brookville, Ind., which took over the Thompson-Morris mill about five years ago and has been operating there since, has been sold to the Babbit-Barbour Asphalt Products, Inc., Madisonville, Wis. Manufacture of felt base for roofing will be continued at the plant, which will be operated by electricity instead of steam as at present. Sam Minge will continue as general superintendent.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
Jan. 27	88.4	Jan. 29	89.1
Feb. 3	88.8	Feb. 5	88.4
Feb. 10	90.1	Feb. 12	88.8
Feb. 17	91.0	Feb. 19	89.2
Feb. 24	89.7	Feb. 26	87.7
March 3	*89.3*	March 4	87.0

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	90.1	92.5	90.6	82.4	88.1
1945	86.7	*90.1*											

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to Date	66.1	78.5	87.1	87.8	104.0	88.2	88.4	*87.9*
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
Jan. 27	95	Jan. 29	95
Feb. 3	92	Feb. 5	97
Feb. 10	93	Feb. 12	97
Feb. 17	93	Feb. 19	96
Feb. 24	97	Feb. 26	93
March 3	*96*	March 4	95

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	*95*											

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

R. W. Upshaw to Be Director

R. W. Upshaw, vice president in charge of manufacturing, of Anheuser-Busch, St. Louis, Mo., has been named a director of Packaging Institute, Inc., according to announcement made by Walton D. Lynch.

Looking Across Twenty-Five Years

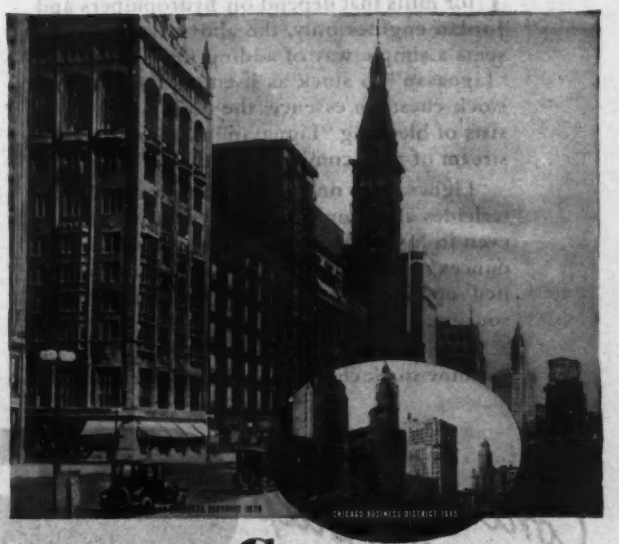
Twenty-five years of impressive growth and progress are reflected in these lake-front scenes of Chicago in 1920 and in 1945. The contrast emphasizes the sweeping changes this swift-moving quarter of a century has brought—not only to urban America but to business and industrial America as well.

In 1920, Witco Chemical Company was a small organization with a single office in Chicago. Today it is an important factor in America's expanding chemical industry, serving manufacturers of rubber, paints, printing inks and many other products from branch offices in leading cities throughout this country, and from London. And Witco's list of chemicals, pigments, asphalts and other materials is constantly increasing to meet the accelerated demands of war.

To you as manufacturer Witco offers the cooperation of its technical staff and the facilities of its modern research laboratory in the solution of production problems. Your inquiries about Witco products will be given prompt attention.

WITCO CARBON BLACK No. 11

A cleaner, dustless black that disperses more readily and evenly to impart a deep, rich tone to your black papers. More economical because it may be added directly to the beater without removal from the bag.



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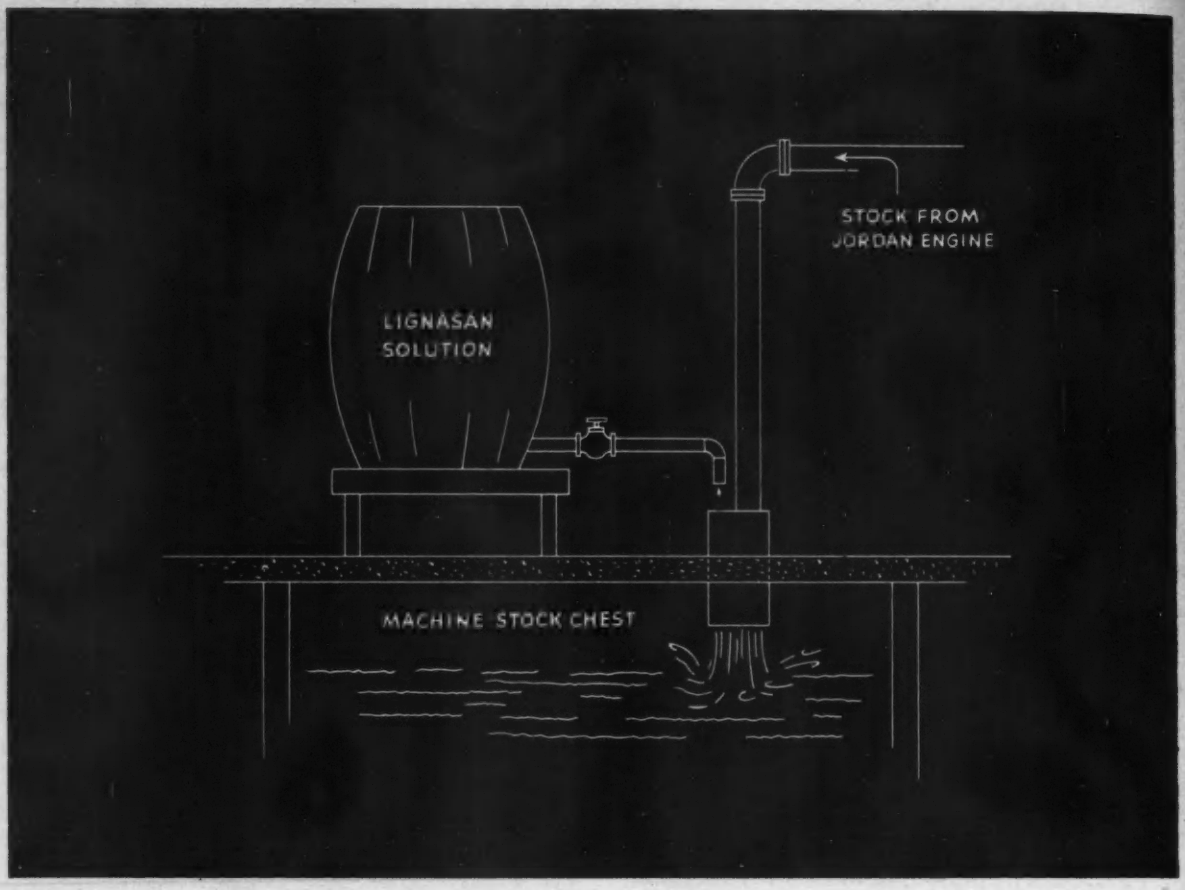

Another spot for slime control

FOR PLANTS THAT DO NOT HAVE BEATERS, for mills that depend on hydropulpers and Jordan engines only, the above set-up represents a simple way of adding *slime-controlling* "Lignasan" to stock as it enters the machine stock chest. In essence, the plan merely consists of bleeding "Lignasan" solution into the stream of pulp coming from the Jordans.

"Lignasan" is one of the most powerful bactericides and fungicides known. It is effective even in low concentrations. Approximately 4 ounces per ton of dry fiber usually can be relied upon to prevent slime formation and souring.

When you add "Lignasan" to pulp held in machine stock chests, you not only protect the pulp from souring during extended shutdowns . . . *you make the entire subsequent paper-making operation easier.* By checking the growth of slime-forming organisms, you reduce clogging of pipes, screens and headboxes and materially cut down on the time and labor needed for washups and cleanings.

Many pulp and paper mill operators have credited "Lignasan" with substantial savings. Get the facts today, and learn how "Lignasan" can help *you* curb profit-stealing slime. Write our nearest branch office or E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

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Section of the
TECHNICAL ASSOCIATION
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122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

The Use of Activated Silica in the Coagulation of Highly Colored Water*

By R. E. Noreus[1]

Abstract

When sodium silicate is treated with various chemicals, an activated silica is formed which has been found to greatly improve the coagulation of water. The use of this material in the treatment of highly colored water has resulted in lower settled effluent turbidities, lower filtered water colors, and increased filter runs.

In the manufacture of fine papers, the use of highly colored water is definitely impractical. The problem of removing this color completely has presented one of the most difficult ones in the science of water treatment.

Effect of Colored Water on Pulp and Paper

In this paper, highly colored waters will be considered to be those with a color of 150 to 400. This color is ordinarily formed by the decaying of organic material such as leaves, wood, and grass; water leaches it out and runs off into nearby swamps from which it drains into creeks and rivers. It is ordinarily in the form of negatively-charged colloidal particles. Unless a large proportion of this color is removed before use in papermaking, the coagulation taking place when water-pulp suspensions are mixed with alum previous to the paper machines results in precipitation of the color on the fibers and greatly reduces the whiteness or brightness of the finished paper. This reduction in brightness is proportional to the amount of color present in the water at the time of sizing and results in 1 to 10 points or more loss in brightness of the paper as measured on the General Electric Reflection Meter. The use of highly colored water for pulp washing where no coagulation takes place is, however, not nearly so detrimental, because the color, being colloidal and having the same charge as the fibers, washes on through. Experiments show a brightness loss of only 1 to 3 points when highly colored water is used throughout the bleaching of soda and sulphite pulps in two and three stages. The final washing and dilution, however, must be made with water of low color to minimize the precipitation with alum mentioned above.

Raw Water

St. Louis River water, with which the information presented in this paper was obtained, drains the northeastern section of Minnesota, flowing mainly through swampy timbered lands. The following analysis is typical:

Color	150-400
Hardness	40- 80 p.p.m.
Turbidity	5- 90 p.p.m.
Methyl orange alkalinity	25- 70 p.p.m.
Phenolphthalein alkalinity	0
pH	6.8-7.2
Total solids	120-125 p.p.m.
Volatile solids	60 p.p.m.
SiO_2	19 p.p.m.
Al_2O_3	0.2 p.p.m.
Fe_2O_3	1-2 p.p.m.
CaO	16 p.p.m.
MgO	12 p.p.m.
NaCl	3 p.p.m.
SO_3	3 p.p.m.

Experience has shown that this water may be coagulated with filter alum alone only when a minimum of 5 to 9 grains of alum per gallon is used. Treatment with less alum results in no coagulation whatsoever. The use of many additional chemicals has been investigated in order to control pH, adjust alkalinities, improve coagulation, and improve color removal. Sulphuric acid, soda ash, lime, iron salts, sodium aluminate, sodium silicate, clay, etc., have been used. In no case has the minimum quantity of alum for coagulation been reduced below that of alum alone, and in most cases, where alkalies have been added, the alum requirement is increased. This matter of alum demand can possibly be explained by the assumption that a "color floc" is formed from the combination of color and aluminum ions as proposed by Miller *(1)* and that no coagulation takes place until this color is completely neutralized. In practically all instances where additional chemicals have been used, no improvement in final water color or equipment capacity has been noted until the use of "Activated Silica" was investigated.

Activated Silica Processes

"Activated silica" is a stable silica sol formed by releasing most of the silica from the alkali in a sodium silicate solution, aging for a period during which the silica micelle grows in size and then diluting at some point before the micelles have become large enough to form a gel. Dilution slows down the growth rate so that gelling does not take place for a considerable length of time. The application of this material in water treatment was first pointed out very clearly by Baylis *(2)* although it had been mentioned vaguely somewhat earlier by Smith *(3)*. Baylis diluted a soluble silicate (1 to 3.2 ratio) to 1.5% SiO_2,

* To be presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

[1] Member TAPPI, Manager Technical Service Department, The Northwest Paper Co., Cloquet, Minn.

neutralized approximately 85% of the alkalinity with concentrated sulphuric acid so that the resulting solution had an alkalinity of 1100 to 1250 p.p.m., aged the solution for 2 hours, and then diluted to less than 0.6% silica. Following Baylis' paper and patent, other activated silica processes were developed. A. V. Graf and W. B. Schworm *(4)* use a silicate solution and alum solution added separately but close together. The N-Sol B process was developed and patented by C. L. Baker and C. H. Dedrick *(5)* of the Philadelphia Quartz Company. In this process, the silicate and a part of the alum are mixed, so as to still leave the mixture on the alkaline side. This is followed by aging and dilution before adding the mixture to the raw water. The remainder of the alum is then added. The N-Sol A process was developed by H. R. Hay *(6)* of the Philadelphia Quartz Company, who has also written several articles which deal with the use of silicates, activated or otherwise, in water treatment and should be studied by anyone interested in the methods of activating silica *(6, 7, 8)*.

Since the N-Sol A method is the one used principally by the writer, it will be explained in detail. In this method, the sodium silicate (1 to 3.2 ratio) is diluted to 1.75% silica and then treated with 19% ammonium sulphate based on the weight of sodium silicate. The ammonium sulphate should be diluted to 10% or less before adding to the diluted silicate. Vigorous mixing prevents localized concentration. The mixture is aged for 2 hours to allow the micelles to grow and is then diluted to 1.3% SiO_2 to stop the growth. This solution is then said to be stable for more than a week. The above dilutions and concentrations may be varied somewhat to change the gel time or final concentration.

The advantages of this process over the others appear to be that no strong acids, with accompanying danger in handling, are used; the ammonia content of the solution is available for chloramine formation after chlorination of the water; there is less chance of gelling; and the coagulation is equal to or superior to the others.

Inasmuch as different uses for water require varying characteristics, it is possible that N-Sol A may not always be the most favorable process. However, one or more of the other methods should prove satisfactory in most cases.

Filter Plant Equipment

The filter plant at The Northwest Paper Company, where the trials were made, is rated at 3500 gallons per minute or 5 million gallons per day. It consists of an Infilco Accelator connected in series and parallel with a settling basin. From either the Accelator or the settling basin, the water flows to ten gravity filters. The clear well is located under the filters. The Accelator is 50 by 50 feet with a 24 foot diameter draft tube. The raw water is treated with alum at the raw water pump suction by the overflow from an alum dissolving tank fed by a gravimetric alum feeder. This feeder as well as the silica solution feeder is controlled by a proportioner which regulates the treatment according to the variation in water flow. A venturi meter on the raw water line activates the proportioner.

For the most part the raw water is pumped to the bottom of the draft tube, although it is possible to bypass the equipment with all or any part of the raw water to the settling basin. The water flows upward in the draft tube taking with it some of the sludge coming in from the settling portion of the equipment. The raw water, sludge, and alum are well mixed by currents from the rotor impeller situated near the top of the draft tube. The mixture is then forced out through this rotor impeller. While the mixture is passing through, the activated silica solution is added to it from a pan on the impeller drive shaft. It is mixed by the centrifugal agitation of the water, and the completely treated water then passes out into the settling section of the equipment. Addition of the silica earlier causes the floc formed to be partially broken in passing the impeller. The settled water is removed by troughs across the open portions of the Accelator and the settled sludge is removed by automatically timed valves. The effluent passes either to the filters or to the settling basin for further settling. The settling basin is 67 by 89 feet and holds approximately 500,000 gallons or 2.5 hours retention. The filters contain 1560 square feet of filter surface, and operate at a rate of about 2 gallons per square foot per minute or higher most of the time.

Operation Previous to Activated Silica Treatment

Until the Accelator and the activated silica treatment were installed about a year ago, 85 to 90% of the color was removed with alum and two settling basins operating in parallel. In other words, a river raw water of 300 meant a filtered water of 30 to 45 apparent color. Turbidity had not been too much of a problem, although the filtered water had a turbidity of about 1. Since this turbidity was colored, it did raise the apparent color 5 to 10 points. Since our experience in papermaking had been that the water color should not be over 25, it meant that any color much over 200 would give us too high a water color. As the river color ranged as high as 400 resulting in a filtered water of 40, it was a considerable problem.

Operation with Activated Silica

When the Accelator was installed it was found that it would operate excellently at about 2000 gallons per minute, but the demand was 3500. It was necessary to bypass 1500 gallons per minute to the settling basin for treatment. Since the equipment was designed for 3500 gallons per minute and its installation was supposed to make the settling basin available for other usage the activated silica process was recommended for investigation. From the beginning, when several batches were made up by the Baylis process, the settling capacity of the unit was greatly increased. Later the N-Sol A process using ammonium sulphate was put into operation. As the operators gained experience with the proper treatments and control of the sludge, the rate increased until at the present time, using 5 to 12 p.p.m. of activated silica and 5 to 7 grains of alum, 4000 gallons per minute can be put through the Accelator with 95% color removal in the filtered water. When the silica treatment is discontinued, the rate must be dropped to 2000 or lower or the sludge will not settle fast enough. The effect of the activated silica is to produce a heavy, large, fast settling floc which leaves 6 to 7 feet of clear water above the sludge bed at any rate up to 4000 gallons per minute.

The main point in the reduction of filtered water color and turbidity resulting from the use of activated silica is the reduced turbidity of the settled effluent. Since the load on the filters is decreased, the colored turbidity carried through the filters is reduced.

Effect of Water Temperature

As the temperature of the water gradually dropped to slightly over 32°F. the coagulation became poorer and it was necessary to increase the activated silica feed from 7 to 12 p.p.m. in order to maintain a satisfactory effluent. Even with this increased treatment the effluent turbidity increased from 5 p.p.m. to 10 p.p.m. The filtered water color also increased about 3 points. However, the results are still much better than without the silica treatment.

Comparative Results 1940 and 1944

Comparing present results with those obtained 4 years ago, a very definite improvement is noted. It is difficult to credit the activated silica alone with this improvement, since in that period, sedimentation settling has been replaced by an Accelator. It can be definitely said, however, that the Accelator capacity to deliver an effluent turbidity of 7 is at least doubled by the use of activated silica. Starting from the basis that activated silica is required for satisfactory Accelator production, the quality improvement between the last 6 months of 1940 and the same period of 1944 is about as follows: With an average raw water of 200 color and 55°F. temperature, the influent turbidities on the filters decreased in 1944 from 20 to 6, the filtered color decreased from 20 to 12, the filter runs increased from 11.5 hours to 20, and the filtered water turbidity decreased from approximately 1.0 to 0.5. The chemical treatment in 1940 was approximately 7.5 grains of alum, and in 1944 6.5 grains of alum and 5 to 12 p.p.m. of SiO_2, the quantity of silica increasing as the temperature dropped. The decreased alum is mainly because of improved feeder control. There are no data to show that the use of activated silica reduces the alum required.

Cost of Activated Silica

With regard to the cost of N-Sol A treatment, based on delivered prices, 1 p.p.m. of SiO_2 per million gallons of water treated costs 43 cents. While the use of silica slightly increases the water treatment costs, the reduction in wash water and improvement in water quality are sufficient to offset it.

Plugging of Filter Beds

Some users of activated silica report that they have had difficulty with clogging filter beds and shortened filter runs, but to date this mill had no such troubles. Hay *(6)* reports that changes in the activation treatment can control this difficulty.

Silica Content of Treated Water

Analyses of river water and filtered water show no buildup in dissolved silicates. Our results indicate 17.5 p.p.m. of SiO_2 in the raw water and 8.5 p.p.m. in the filtered water showing that all of the activated silica is removed by coagulation.

Conclusions

In the treatment of a high colored soft water, the use of activated silica will produce a filtered water of lower color and turbidity in an increased quantity from the same equipment, and will improve the length of filter runs. These improvements can be attributed to the much lower effluent turbidities resulting from the heavier, faster settling coagulation.

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TAPPI Notes

John H. Rich, formerly of the Newton Falls Paper Company is now production manager for the Plastic Film Corporation, Plainfield, Conn.

James R. Arthur, formerly of the Maxwell Paper Company is now chemist for the Port Huron Sulphite Paper and Pulp Company, Port Huron, Mich.

Floyd G. Scammon, formerly plant engineer at the Webster Mill of the International Paper Company, is now plant engineer for Fraser Papers, Ltd., Madawaska, Maine.

O. E. S. Hedbring is now assistant to the vice president in charge of production of the Ohio Boxboard Company, Rittman, Ohio.

George C. Borden is now technical director and manager of the coating department, Riegel Paper Corporation, Milford, N. J.

Fred I. Jacoby is now vice president and general superintendent of the Riegel Paper Corporation, Milford, N. J.

Harold C. Friel is now vice president in charge of operations, Wood Flong Corporation, Hoosick Falls, N. Y.

Charles P. Kirchen, technical service engineer for the American Cyanamid and Chemical Corporation, has been transferred from Kalamazoo, Mich., to Mobile, Ala.

The Chicago Professional Paper Group will meet at the Chicago Bar Association, 29 S. LaSalle street, Chicago, Ill., on Monday, March 19, 1945 at 6:30 P.M. L. P. Killilea, C. E. Batchelder, P. L. Lefebvre and F. K. Shankweiler of Hercules Powder Company will discuss "Recent Developments in Paper Chemicals."

Plastics

Plastics, Scientific and Technological by H. Ronald Fleck is a new 325-page (6 x 9) book issued by the Chemical Publishing Company. It comprises a critical survey of the literature and a correlation of scattered data which is of value both to chemists of the plastics industry and to the practical men whose work requires a knowledge of the chemistry and technology of plastics. The newest developments in plastics both in the United States and in Europe are discussed in great detail. There are many tables, diagrams and data primarily for technical men who are seeking much more than an elementary book on the subject. Mr. Fleck is an English scientist.

Among the subjects covered are the following: raw materials, theoretical principles of polymerization, chemistry of plastic materials, manufacture of plastics, rubber-like plastics, properties of thermoplastic and thermosetting materials, synthetic resins, fibers and textiles, adhesives and chemical analysis.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd street, New York 17, N. Y. at $6.50 per copy.

The Preparation and Applications Of Pulp-Resin Preforms*

By R. H. Mosher[1], N. N. T. Samaras[2], and L. M. Debing[2]

Abstract

The art of pulp molding is quite old. Although pulp forms have been produced for many years, it is only within the last few years that there has been any commercial interest in production of pulp-resin preforms. These preforms produce molded pieces which possess high physical strength properties and good surface charactertistics and chemical resistance.

When pulp-resin preforms are molded, very little flow of the fiber and resin is necessary as the material is uniformly distributed throughout the mold. Since relatively low pressures are required, either solid dies or flexible rubber bag type molding units can be used.

The preforms are prepared by breaking up the pulp in a beater, forming the preform in a vacuum or pressure felting unit, and drying out the water in a circulating air oven. The resin can be incorporated either by dispersion in the beater so that the pulp and resin are preformed together, or by felting the pulp preform and then incorporating the resin by an impregnation operation.

The resins utilized in the process can be either thermosetting or thermoplastic in nature. In general, however, phenolic or melamine thermosetting resins are used because they produce moldings which are stable over the temperature range of −60°C. to +150°C. and are highly resistant to chemical action. The physical strength properties of the molded pieces depend upon the type of fiber as well as the type and method of incorporation of the resin.

Pulp preforms can be used in the field of small moldings where a large number of pieces of the same dimensions which require high physical strengths are necessary. On the other hand, the big field of the future is visualized in the production of medium and large pieces which cannot be economically molded using present day materials. Here the physical strength properties are a necessity and the good appearance is a definite advantage.

The pulp and paper industry has shown an extensive interest within the last few years in possible applications of their products in the highly publicized field of plastics. Large pulp and paper companies, speculatively eyeing post-war markets for present high tonnages, are vigorously evaluating usage of their materials in the fields of dissolving pulps, paper laminates, and pulp preforms. The dissolving pulps require special bleaching and purification treatments, however, and only a few companies are set up to satisfy this specialized market. The field of laminating papers has now also become highly individualized; papers for punching, electrical, and high strength usage are only a few of the grades produced in relatively high tonnage by companies which specialize in these products. In the field of plastic fiber-resin combinations using pulp-resin preforming, the tonnage of pulp used is over 1000 tons a year *(1)*. There is no special treatment required of the pulp, and all types are being utilized.

The art of pulp molding is quite old *(3)*. The earliest known patents were issued around 1865 and covered the preparation of such articles as pulp hats and coffins. The production of papier-maché articles and the well-known pie plates and milk bottle caps has been continued on through the years, with numerous process and equipment patents being granted. In the last few years, interest has increased in the commercial production of articles containing synthetic resins in combination with the pulp articles. In general, the plastic pieces are produced using thermosetting resins but there is no inherent reason for not employing thermoplastics if they are able to impart certain desired qualities to the finished piece.

General Information on Pulp Preforms

The question is often asked, "Why use pulp preforms when regular plastic moldings can be made so easily?" If one can visualize the eventual use of pulp preforms in the production of large units, such as radio cabinets and refrigerator doors, as well as in the small pieces requiring high strength properties such as are now being commercially produced, the answer becomes readily obvious.

When a wood flour or cotton flock filled molding powder is molded in a large cabinet die containing a deep draw and sharp-angled corners, excellent flow of the plastic material or high molding pressures are required. The resulting cabinet has an excellent and smooth surface finish, but the physical strength characteristics for this application are only fair. This cabinet would easily shatter if dropped or given a sharp blow. By molding this same cabinet with a rag or cord-filled molding compound, however, a piece could be produced which would have the desired high physical strength properties. On the other hand, it would have a relatively poor surface and because of the limited flow charactertistics of these materials would require very much higher molding pressures. This example illustrates basic limitations of molding compounds or powders for the production of large pieces.

When using a pulp preform to make this same piece, however, the pulp mold is made to conform very closely to the dimensions of the final molded piece. It goes into the press with the correct amount of fiber and resin distributed uniformly throughout the die. Consequently, when the press is closed, no flow of the fibrous filler is required and only compression and resin flow take place. The final molded product is therefore composed of a uniform material containing a continuous felted and interlocked fibrous reinforcing structure, bonded together by the synthetic resin. This produces a dense, hard and smooth surfaced piece which is resistant to shock, wear, and chemical action.

The preforms may be molded as prepared or

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stacked in storage until needed, as there is no apparent deterioration over a reasonable period of time. If the design permits, the preforms can be molded in conventional metal dies if desired, but in many cases the use of an expanding rubber bag mold is necessary or advantageous *(16)*. In some respects this would be the most effective method of pressure application, in that axial pressure would be exerted equally and simultaneously on all parts of the preform. It must be remembered, however, that the use of the bag would leave one side of the molding with a rough surface. While this would no doubt be a detriment to such an object as a mess tray, it should be no drawback for a piece like a radio cabinet or a business machine housing.

The mold costs are not excessively high because Kirksite, Meehanite, or some of the other easily cast and machined metals can be used *(11)*. By using a mold which utilizes a rubber bag to apply the desired pressure, the size of the molded piece is not limited by the capacity of available presses as is often true at the present time with molded articles. While it has been claimed possible to use cast resin, plaster of Paris, or hard wood dies, we have found that, for the best results, both the male and female units of the die should be heated so that resin flow and cure are equalized and a uniformly molded and cured piece is obtained.

The natural color of phenolic resins is a shade of brown or tan, but by dyeing or pigmenting the pulp, a range of colors can be prepared. By using melamine resins and white pulps, light and pastel shades can be produced, and for some pieces this would be a distinct advantage. It is also possible to surface relatively flat preforms with a thin wood veneer, cloth sheets, or printed paper, so that after molding has taken place, the surface layer is an integral part of the piece. If desired, the molded preforms can be surfaced or sprayed like any other plastic material.

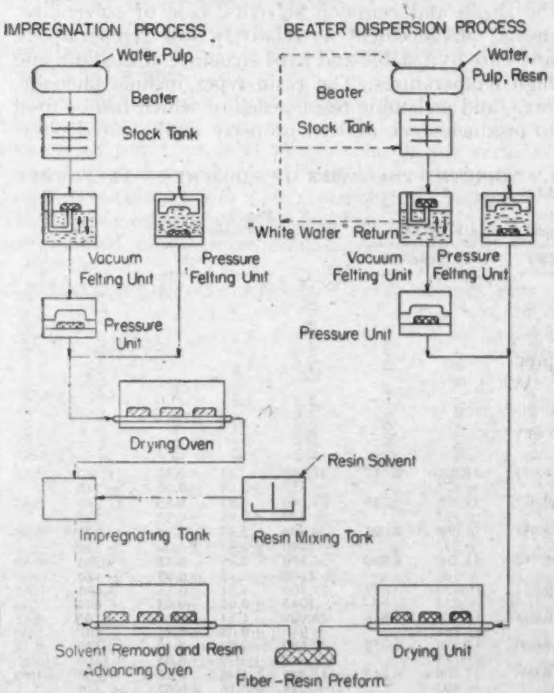

FIG. 1

Flow Sheet on the Preparation of Fiber-Resin Preforms

Preparation of the Preforms

There are two general methods of preparing pulp-resin preforms: the first by dispersing the resin throughout the pulp in the beater or stock tank and then felting out pulp and resin together in the preforming unit; and the second, by preforming the pulp and then adding the resin by an impregnation operation. The various steps involved in each method can be seen in the pictorial flow sheet in Fig. 1 and are described below:

Beater Dispersion Methods

The pulp is broken up in the beater with just enough processing to thoroughly separate all fiber bunches and uniformly disperse the individual fibers. The resin can then be added to the pulp, either directly in the beater or if desired, in a stock or mixing tank into which the beater has been emptied. The resin can be added in the form of finely ground particles or as a solution or emulsion from which the resin can be precipitated. The fiber and resin mixture should be thoroughly agitated in order to obtain a uniform dispersion of the resin through the pulp slurry. The fiber-resin dispersion can then be pumped to a stock tank and held for a reasonable period of time before use but good agitation must be maintained in order to keep the mixture well dispersed.

The fiber-resin dispersion is then metered to the felting tank and here there is a choice of two-preforming methods.

Vacuum Felting—The preforming may take place in an open tank, wherein the consistency is accurately controlled by a suitable device. The forming die, composed of a perforated metal backing covered with a fine wire screen, is lowered beneath the water surface, vacuum applied, and the water pulled through while the fibers and resin collect on the felting screen. There is generally a small part of the resin in the form of minute solid particles and some soluble portions which are pulled through the screen and appear in the "white water." By using a closed system in which the waste water from the felting tanks is redistributed as make-up water in the beater or dilution water in the felting and stock tanks, this loss can be reduced to a minimum value. Experimental runs have shown that there is an equilibrium set up in the "white water" for both solids and solubles, and when this has been attained, additional losses are negligible.

The screen is then raised above the surface of the water, the vacuum cut off, and air pressure utilized to release the preform. If it is relatively small, the preform will be self supporting, but if it is large in area or heavy, some sort of a transfer die or supporting member must be used.

The preform still contains a large amount of free water and has a high bulk factor, so the general procedure is to transfer the preform to another die wherein pressure can be applied to reduce the bulk and remove most of the free water. Numerous patents have been taken out covering equipment to automatically felt and presqueeze preforms in a continuous process and a number of the units are now in commercial operation *(12, 13)*.

Pressure Felting.—The alternative process for preparing the preform is known as pressure felting *(14, 15)*. In this type of operation, the metered amount of stock is injected into a closed unit, the bottom of which

is the forming screen and the top a movable piston fitted with a screen. When the charge of stock is all in the unit, the vacuum is applied to top and bottom screens simultaneously while the piston descends, thus forming the preform between the two screens. This type of felting unit, although more or less limited to one specific piece or type of piece, has a high rate of production and the preforms produced have very accurate dimensions and are of uniform density. Since the preform has been presqueezed during the last portions of the felting operation, there is no need for a separate densification and water removal step.

The felted preforms are then oven dried to remove the remaining water and bring the preform to the desired volatile content for molding. Care must be exercised during the drying operation, that the temperature is not run too high in the case of thermosetting resins in the preform, since they are susceptible to advancement and loss of flow properties.

Impregnation Methods

The preparation of the preform is the same as previously outlined except that no resin is added to the pulp slurry. Either vacuum or pressure felting methods can be used, but care must be exercised during the presqueezing operation and the final portion of the pressure felting operation so as not to densify the preform too much, or the impregnation with the desired resin will be difficult.

The oven dried preform is then impregnated with a solution of the resin. By carefully adjusting the impregnation conditions, such as temperature, viscosity, and total solids content of the resin solution and the time of submersion, the desired resin pick-up can be closely controlled within narrow limits.

The impregnated preform is then placed in an oven and the solvent removed while the resin is advanced to the moldable state. The solvent may be recovered if desired but is generally merely exhausted to the atmosphere.

Both methods of preform preparation are in current use on a production basis in this country.

Resins Utilized

The resins used in the process can be divided into two main groups according to the method of incorporation into the fiber preform. The first type includes those which are added by the beater dispersion technique, and the second the types added by the impregnation methods.

Beater Dispersion Resins

The main characteristic of the beater dispersion resins is that they must be practically water insoluble in the fiber-resin dispersion. Whether put into the beater as an insoluble and finely divided solid, or as an emulsion or solution from which the resin can be precipitated in the final fiber-resin dispersion, the resin must be in a form that can be filtered out with the pulp on the preforming screen.

Into this general category fall finely divided phenolic resins which are mechanically retained by the fibers during the felting operation, and phenolic resin solutions and emulsions which can be precipitated after dispersion and in part attached chemically or colloidally to the fiber and in part retained mechanically during the felting. Also listed here are the various water insoluble thermoplastics, such as the aniline resins *(18, 20)*, coumarone and indene resins *(17)*, lignin resins, polystyrene and other vinyl resins *(19)*, etc.

Impregnation Resins

There are three general methods and resin types used for the preparation of resin-fiber preforms by impregnation methods. In the first two cases, the solvent carries the resin throughout the preform in order to form a thin film over each fiber, and in the third case, very low viscosity polymerizable liquids (monomeric solutions) containing no solvent are used to thoroughly impregnate the preform.

Solutions and emulsions of condensation type resin. —The most important characteristics of the resin include solubility or dispersibility in one or more of the cheap and common solvents, ease of solvent removal, advancement at relatively low temperatures, and cure to a stable and hard structure at medium and high temperatures. The resin types include phenolic, urea, and melamine resins, each of which can be used to produce some desired property in the cured piece.

TABLE I.—THE EFFECT OF FIBER TYPE ON THE PHYSICAL STRENGTH PROPERTIES OF FIBER-RESIN PREFORMED MATERIALS

Preformed Fiber Type	Resin Type and Content	Molding Pressure, P.s.i.	Specific Gravity	Flexural Strength (P.s.i) Parallel (#) Flexural, P.s.i.	Parallel (#) Deflection, Inches	Perpendicular Flexural, P.s.i.	Perpendicular Deflection, Inches	Edgewise Compressive Strength, P.s.i.	Impact Strength (Notched Izod) Ft. lb./inch of notch Perpendicular	Parallel (x)	Tensile Strength, P.s.i	Water Absorption, %
Kraft	Phenolic 45%	2000	1.33	17,140 ± 1008	0.081	17,120 ± 676	0.077	27,400 ± 333	3.11 ±0.10	0.85 ±0.05	11,400 ± 740	0.58
Alpha	Phenolic 45%	2000	1.35	17,100 ± 700	0.071	19,300 ± 775	0.088	25,540 ± 804	1.91 ±0.09	0.85 ±0.03	11,260 ± 1243	0.43
Defibered rag	Phenolic 45%	2000	1.35	17,000 ± 775	0.097	16,200 ± 533	0.093	26,400 ± 1200	2.67 ±0.15	1.54 ±0.04	10,000 ± 320	0.66
Sulphite	Phenolic 45%	2000	1.35	13,930 ± 252	0.067	15,260 ± 328	0.060	26,500 ± 1300	2.69 ±0.32	0.78 ±0.04	9,500 ± 480	0.69
Groundwood	Phenolic 45%	2000	1.34	11,800 ± 220	0.055	10,820 ± 234	0.059	22,400 ± 1243	1.21 ±0.07	0.55 ±0.04	8,400 ± 809	0.43
Waste paper	Phenolic 45%	2000	1.35	11,600 ± 1732	0.044	12,320 ± 864	0.046	28,000 ± 943	1.54 ±0.09	0.61 ±0.21	8,100 ± 807	0.55
Asbestos glass-fiber 85-15.	Phenolic 45%	2000	1.72	17,700 ± 525	0.050	17,970 ± 1155	0.050	27,000 ± 640	2.94 ±0.19	2.10 ±0.05	9,300 ± 1400	0.14
Lignin enriched filler....	None	6600	1.43	11,420 ± 172	0.044	11,300 ± 592	0.042	16,840 ± 348	1.45 ±0.16	0.70 ±0.07	7,200 ± 279	4.09
Lignin enriched filler....	Phenolic 20%	4400	1.42	8,200 ± 325	0.030	8,470 ± 490	0.034	20,530 ± 1001	1.39 ±0.12	0.57 ±0.05	7,200 ± 1160	0.78

(#) Broken parallel to molding pressure. (x) Notch runs parallel to molding pressure.

Moldings prepared with these resins can be removed from the mold at the end of the curing period without cooling the mold.

Solutions and emulsions of thermoplastic resins.—Except for aniline types, only emulsions of these resins can be used, because of the high viscosity of the solutions. There is not much demand for these materials, because of the poor stability against heat distortion, high cost of the resins, and the necessity to cool the mold before the cured piece can be ejected.

Polymerization Type Resins.—The main requirements of this type of resin for application in the pulp preforming process is that the monomeric solution be of sufficiently low viscosity so that thorough impregnation of the preform can take place. The resins do have the advantage of not giving off any vapors during the curing operation and requiring only the minimum of molding pressures, thus reducing mold and press requirements.

In general, it is believed that the materials which can be most effectively utilized in the pulp preforming process are the phenolic and melamine resins. The pieces produced using phenolic resins possess high physical strength properties, are stable over a wide range of temperatures (−60°C. to +150°C.), can be pulled while still hot from the mold and are highly resistant to chemical action. The cured pieces are dark in color but for most structural and large unit applications, this is not important. The melamine resins also possess good physical strength properties and can be produced in light and pastel colors.

The Physical Strength Properties of Preformed Molded Resin—Fiber Combinations

The physical strength properties of the molded pulp-resin preforms are dependent upon two main factors, the first being the type of fiber employed as a filler, and the second being the type of resin used and the method of incorporating it into the preform. The properties are also dependent of course on other variables, such as molding conditions, preform drying conditions, etc., but these can be controlled to obtain the desired results.

The effect of the type of fiber on the physical strength properties can be found in Table I. A number of preforms were prepared using the various types of commercial fibers and impregnated to a given resin content with a standard phenolic resin *(9)*. They were carefully dried to 5% free volatile content and molded under standardized conditions. All the physical properties were determined on specimens machined from molded preforms and all reported values were determined according to A.S.T.M. standard testing procedures for plastic materials. The requisite number of individual test values were obtained and the "standard deviations" from the reported average calculated according to A.S.T.M. procedures. In general, it can be said that the ideal fiber for use in this process is long enough to give good felting properties, but not so long as to produce an excessively bulky preform. If the fibers are too short as in groundwood or waste paper, they tend to plug up the openings in the felting screen and make further felting almost impossible.

The effect of the resin type and method of application can be seen in Table II. A complete discussion of the effect of these resin and fiber types on the physical properties of the resulting molded preforms, has been published in *Modern Plastics (9)*.

Commercial Applications for Pulp Preforms

Generally speaking, pulp preforms are used for one of two reasons. First, they may offer an advantage over the materials now being used; secondly, they may make possible the molding of pieces which cannot be satisfactorily produced by standard materials and techniques.

Pulp preforms can be used in the field of smaller moldings, whenever a large number of pieces can be turned out using the same preforming and molding dies, and wherever there is a definite demand for exceptional physical strength, good chemical resistance and surface properties. Such applications are now being exploited by several large companies *(4, 5, 6, 7, 8, 10)*. The scope of these products ranges from plates and serving trays, alarm clock cases, equipment bases, and telephone stands, through to the medium size articles such as business machine housings. In this field, however, it must be remembered, especially with the smaller pieces, that the principal competition is with the regular molding compounds.

The other, and mainly unexplored field, is that of large moldings, where good physical strength properties are a necessity and good appearance is an advantage. This field includes the medium and large pieces which cannot be profitably molded by any other process. Here such objects as table and desk tops, refrigerator doors, automotive and decorative panels, radio cabinets, furniture, and many other are visualized. In this field, the only present methods which

TABLE II.—THE EFFECT OF RESIN TYPE ON THE PHYSICAL STRENGTH PROPERTIES OF FIBER-RESIN PREFORMED MATERIALS

Preformed Fiber Type	Resin Type and Content	Molding Pressure, P.s.i.	Specific Gravity	Flexural Strength (P.s.i) Parallel (#) Flexural, P.s.i.	Parallel (#) Deflection, Inches	Perpendicular Flexural, P.s.i.	Perpendicular Deflection, Inches	Edgewise Compressive Strength, P.s.i.	Impact Strength (Notched Izod) Ft. lb./inch of notch Perpendicular	Parallel (x)	Tensile Strength, P.s.i	Water Absorption, %
Kraft	Beater dispersed phenolic 45%	2000	1.36	28,000 ± 450	0.201	29,940 ± 1233	0.180	22,400 ± 80	5.07 ±0.41	0.91 ±0.13	19,200 ± 1034	2.21
Kraft	Impregnated phenolic (alcohol solution) 45%	2000	1.33	17,140 ± 1008	0.081	17,120 ± 676	0.077	27,400 ± 333	3.11 ±0.10	0.85 ±0.05	11,400 ± 740	0.58
Kraft	Impregnated phenolic (water solution) 45%	2000	1.34	15,900 ± 250	0.060	15,075 ± 750	0.066	33,700 ± 460	1.92 ±0.09	0.77 ±0.13	10,920 ± 1144	0.41
Sulphite	Impregnated melamine (alcohol-water solution) 45%	4000	1.40	13,000 ± 1114	0.054	13,700 ± 650	0.049	19,100 ±2500	2.17 ±0.78	0.64 ±0.04	7,500 ± 564	0.60

(#) Broken parallel to molding pressure. (x) Notch runs parallel to molding pressure.

could possibly be used are post-forming or low-pressure laminating, and each of these techniques possesses definite inherent advantages and disadvantages *(2)*.

It is confidently predicted that these pulp-resin combinations will be widely accepted, employing newer techniques and improved resins. Pulp molders and resin suppliers have been mainly responsible for the development to date. However, in order to fully realize the potentialities of these processes, the interest and cooperation of the pulp and paper industry must be enlisted.

Acknowledgment

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The Establishment of Standard Testing Methods for Light Fastness in the Paper Industry*

By H. A. Lips[1]

Abstract

The necessity of having a standard light fastness test for paper has been recognized for some time. In order to appreciate this problem the historical background of the present day fading lamps, and of the dyed woolen standards used by the textile industry for rating light fastness exposures are discussed. A study made by the Technical Section of the Paper Makers Association of Great Britain on the question of a standard method for determining the light fastness of paper is reviewed briefly.

A new method for comparing fading lamps on the basis of standard hours of exposure is being studied by the light fastness committees of A.A.T.C.C. and A.S.T.M. It is proposed to use as control, a piece of dyed paper or textile, that will give a desired degree of color destruction when exposed in a standard lamp for 20 hours. The control would be exposed simultaneously with the sample that is to be tested. It would be removed after 20 hours of exposure and compared with the plastic standards which will illustrate the condition of the control after exposure in a standard lamp for 12, 14, 16, 18, 20, 22, 24, and 26 hours. The exposure time would be corrected accordingly and reported in terms of standard hours.

Light fastness is one of the oldest problems associated with the use of color. In olden times there was little that could be done to counteract the adverse influence of light on the color of a dyed material. This was true because of the few colors available. The user had to be satisfied with the color regardless of whether it was fugitive or not. As newer coloring materials were developed the problem of light fastness became more and more important. As long ago as 1672 Louis XIV of France became concerned with the problem of light fastness. He instructed his Minister of Finance to prepare a code of regulations to control the dyers. This was published as "General Instructions for Dyeing Wool in all Colors." These regulations divided the dyers into two groups — "Dyers of the Great Dye" and "Dyers of the Little Dye" in order to differentiate dyers using fast colors from those using fugitive types.

The synthesis of mauve in 1856 by Perkin opened the door to the introduction of the many synthetic dyes that have since been developed. This greatly increased the necessity for establishing some means for controlling light fastness, and for making light fastness comparisons. Even at this early date some scientists were studying the question of light fastness. One investigation had previously shown that little fading takes place in the absence of moisture or air.

Sunlight Exposures

In the years prior to 1900 all fading tests were made by sunlight exposures. These exposures were generally quite erratic and did not compensate for the influence of clouds, mist, time of day, or time of year. As these variables became better known, numerous attempts were made to standardize sunlight exposures. Attempts were made to measure the energy of the sun's rays and to make exposures for a definite number of energy units. These tests generally failed to take into consideration such factors as changes in humidity, etc.

Lenses were also tried in an endeavor to concentrate the sun's rays and thereby speed up the time

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required for fading exposures. These tests were unsuccessful because the excessive heat developed during exposure affected the results so that they were not comparable with normal exposures.

In 1927 the National Bureau of Standards in Washington published the results *(2)* of a series of sunlight exposures made at the Bureau. While these exposures were being made the energy of the sun was carefully measured by using a barium high-vacuum photoelectric cell. The results indicated that the quantity of energy did not necessarily correspond with the degree of fading.

The National Bureau of Standards in 1929 reported the results *(3)* of an elaborate series of exposures made during the years 1926 and 1927 at the Bureau. Over 1200 dyeings were exposed simultaneously, the purpose being to compare the fadings with and without a cover-glass, the fading in north night, and the fading in sunlight resulting from continuous, intermittent, and identical exposures in 2 consecutive years. These dyeings were also compared with Fade-Ometer exposures.

There is still a demand for a standard method for making sunlight exposures. The 1943 A.A.T.C.C.* Yearbook *(4)* describes a standard method for making such tests. The samples are mounted in an exposure cabinet which is covered with a good grade of window-glass approximately 0.125 inch thick. The cabinet is open at the sides to allow free circulation of air. The specimens should be not less than 0.5 inch from the glass, which should be kept clean. The cabinet is placed in a location free from shadows and inclined at an angle of 45° facing due south. Exposures are made between the hours of 9 a.m. and 3 p.m. (standard time) on sunny days between April 1st and October 1st.

Artificial Lamps for Evaluating Light Fastness

The natural disadvantages of relying on sunlight for fading tests created a demand for some artificial fading device that could be substituted for the summer sun. In the years following 1900 a great many artificial fading lamps were introduced.

In 1904 De Bruyn used a 750-watt tungsten filament lamp as a means for light fastness control. This lamp was equipped with a series of colored filters to correct the spectral distribution of the emitted rays, and a lens for concentrating the beam of light. A water-cooling system was employed to reduce the temperature. The lamp was claimed to have 50 times the intensity of sunlight.

Quartz mercury lamps were tested by a number of investigators as artificial fading lamps. In 1912 a British scientist showed that fadings in this lamp did not correspond with daylight exposures. The light rays emitted by this lamp were found to contain too high a percentage of ultraviolet.

Mott, in 1915, used a white flame arc light. Ten to 15 hours of exposure were claimed to be equivalent to 50 hours of direct sunlight. This lamp generated considerable heat and the results were not reliable. Another investigator working at about this same time demonstrated that the intensity of the light source was very important. A series of dyed textiles which faded at one intensity did not fade to the same extent when faded at a different intensity. That is the fastest to light dyeing at one intensity may have rated poorer at another intensity.

Carbon arc lamps were tested as fading lamps and about 1920 were introduced under the name of Fade-Ometer. In England, a similar lamp was introduced as the Fugitometer. This lamp was designed to closely approximate the radiation from the sun during the noon hour of a clear day late in June. The intensity of the light was only slightly stronger than that of the summer sun. This was a considerable improvement over previous fading lamps.

Fade-Ometers have been improved considerably since this time and are today often considered the standard lamps for making fading exposures. The A.A.T.C.C. Artificial Light Fastness Test *(4)* reads as follows: "The apparatus for this test shall be a type FDA Fade-Ometer or its equivalent, operated under the conditions recommended by its manufacturer."

It is well known that even the best fading lamps operating under identical conditions will not always give identical fading results. Two lamps operating on the same voltage line may differ considerably. Naturally, older lamps may not give the same results as they did originally or as the new lamps do today. Neither the manufacturer of the fading lamp nor the light fastness committees have as yet learned what is responsible for these differences. Even with the known differences in the rate of fading between lamps we still speak of light fastness in terms of Fade-Ometer hours.

Another problem is how to describe the degree of fading or how to rate light fastness so that various mills making light fastness exposures can compare fadings in terms of a common language. In order to accomplish this a considerable amount of work has been done toward the establishment of color standards for light fastness comparisons.

Light Fastness Standards

Early in the 1890's, Hummell, working with the British Society of Dyers and Colorists, proposed a set of standards for comparing sunlight exposures. Numerous other investigators were also working on dyed standards for comparing exposures. A number of these were made from cotton dyed with indigo in various depths of color. Kraiss, working in Germany in 1911, experimented with paper standards dyed with Victoria Blue R. This color was chosen because it faded uniformly in the sun from hour to hour until the color was destroyed. Eosine dyed paper standards were proposed in 1918 by another investigator.

Color fastness committees in England, Germany, and later in this country studied many different textile standards. Standards were developed for each fiber such as cotton, wool, silk, rayon, etc. Recently, wool standards have been used more or less exclusively because this fiber appears to be least affected by changes in humidity. At the present time the A.A.T.C.C. uses eight dyed wool standards for controlling textile fastness exposures.

In general, the textile industry has worked on standardizing methods that may be classified into two groups:

A. To expose the sample until a definite degree of fading has occurred and express the results in the time required.

B. To expose a sample and a set of graduated standards for a given interval of time and note the color change.

In 1936 the Technical Section of the Paper Makers Association of Great Britain reported *(5)* the results of their fastness committee's investigation regarding the use of standards for comparing the fastness to light of colored papers. The following approaches were investigated:

(a) Wool standards.

(b) Printed standards for contrast.

(c) Fluorescence: The loss of fluorescence during exposure.

(d) Graded paper standards: Eleven standards of dyed paper prepared by mixing three dyes of different fastness in varying proportions.

(e) Graded paper standards showing dyeings of varying depths.

(f) 1. A standard dye applied on a furnish consisting of varying percentages of bleached and unbleached sulphite.

2. A standard furnish and a single dye to which increasing amounts of a chemical that would reduce light fastness were added. The chemical used was hexadecylpyridinium bromide.

(g) Wedge system: Actinometric paper was used to measure the light intensity to which the sample was exposed. A wedge-shaped slide which transmitted graded amounts of light was used. When this was laid over the standard colored sheet it simulated the effect of graded bleaching. Using this method, the best results were obtained with a cotton rag pulp dyed with 4% Acid Rhodamine 3R, 2% of rosin size and 4% alum. The object of this system was to measure the amount of daylight or artificial light to which the samples were exposed and to yield a series of graduated contrasts for comparison with the simultaneously faded sample. The necessity of exposing a number of graduated standards was thereby eliminated.

The preceding paper was presented at the 1936 General Conference of the Technical Section of the Paper Makers Association of Great Britain. It is probably the most comprehensive piece of work that has thus far been done in the field of light fastness specifically for the paper industry. The writer does not know whether this work was carried to a successful conclusion and whether a definite standard testing method was adopted.

Present A.A.T.C.C. Light Fastness Standards

The A.A.T.C.C. *(4)* at present uses a set of eight dyed woolen pieces as standards for classifying light fastness. These standards are coded L-1 through L-8. Standards L-1, L-2, and L-3 are recommended for sunlight exposures. Standards L-3 through L-8 are for use in classifying exposures made in an artificial fading lamp.

Light fastness is classified in terms of the change in the color standard. For instance, L-4 corresponds to the light fastness of textiles that show no greater change in color than Standard L-4. When these standards are used consistently, a considerable part of the useful space of the Fade-Ometer is in use in exposing the standards.

This fact indicates the desirability of measuring the quantity of fading energy generated by the lamp in a definite time period. The purpose of this test would be to establish a means to compensate for the known or indicated differences between fading lamps, so that exposures made in one lamp could be interpreted to correspond with exposures made in any other lamp.

TABLE I.—HOURS OF EXPOSURE FOR JUDGING FASTNESS BY COMPARISON WITH THE STANDARD DYEINGS

		Standard Sun Test Hours	Fade-Ometer Test Hours
Standard	L-1	1.5-3	0-0
	L-2	3-6	0-0
	L-3	6-12	5-10
	L-4	12-24	10-20
	L-5	24-48	20-40
	L-6	48-96	40-80
	L-7	96-192	80-160
	L-8	192-384	160-320

Present Work

It is the opinion of the fastness committees of the A.A.T.C.C. and the A.S.T.M. that in addition to the present wool standards a method is needed for standardizing fading lamps. In recent years we have become more or less accustomed to speaking of light fastness in terms of Fade-Ometer hours. Naturally, it is important to have as a guide a standard hour rather than a measure that in itself is a variable. These fastness committees have been attempting to find some simple test that would give the results desired and at the same time not represent an appreciable capital investment. The Optical Properties Committee of the TAPPI has been considering this same problem and has deemed it worthwhile to have one of its members review this work for the association.

The present thought is that a control, which might be a piece of dyed paper or a textile colored with a dye or dyes selected to exhibit the required sensitivity, be exposed in the lamp daily for 20 hours or for the length of time a trim of carbons serves. After 20 hours exposure the control is to be removed and compared with a set of standards. These standards will consist of permanently colored plastic chips which will illustrate 12, 14, 16, 18, 20, 22, 24, and 26 hours of exposure in the standard lamp.

As an illustration for commercial use, the control and the sample to be tested will be exposed simultaneously. After 20 hours the control will be removed and compared with the standard plastic chips. If the control shows no difference in shade from the Standard after 20 hours of exposure it would indicate that the lamp under consideration performed in the same manner as the standard lamp for this 20 hours of exposure. Therefore, all samples in this lamp would be credited with 20 hours of exposure.

If, however, after an exposure of 20 hours in the lamp under consideration, the control appeared like the plastic chip representing 14 hours exposure all the test samples exposed at this time would then be credited with having received only 14 hours of exposure.

The committees now intend to select as a standard lamp one that would represent the average degree of color change exhibited by the control after 20 hours of exposure in fifty or more lamps. In this way it would be possible to set up a simple, practical means for comparing all fading lamps on a more rational basis. The dyed control would be made available to any person interested and the plastic chips would be obtainable at reasonable cost.

This proposed method could also be used for rating sunlight exposures. It would afford a practical means for relating these exposures to those made in a fading lamp in terms of standard hours.

It is hoped that this report will serve as a background for developing a standard light fastness test for the paper industry so that all light fastness exposures may be reported in terms of standard hours.

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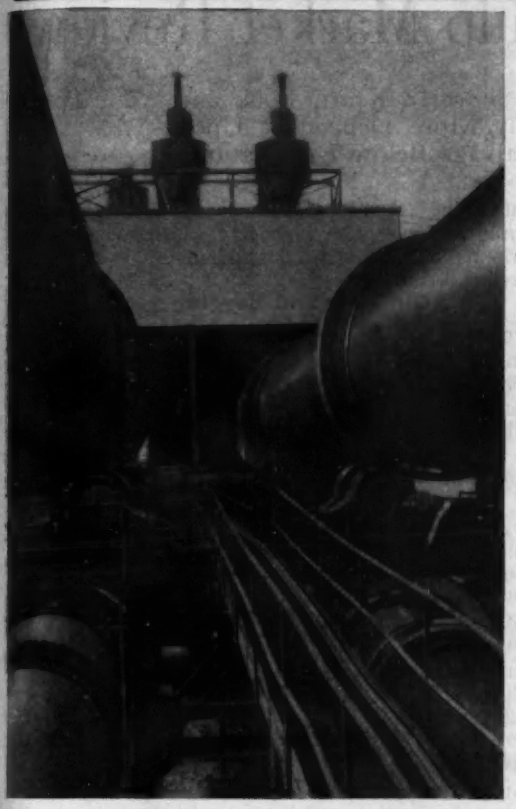

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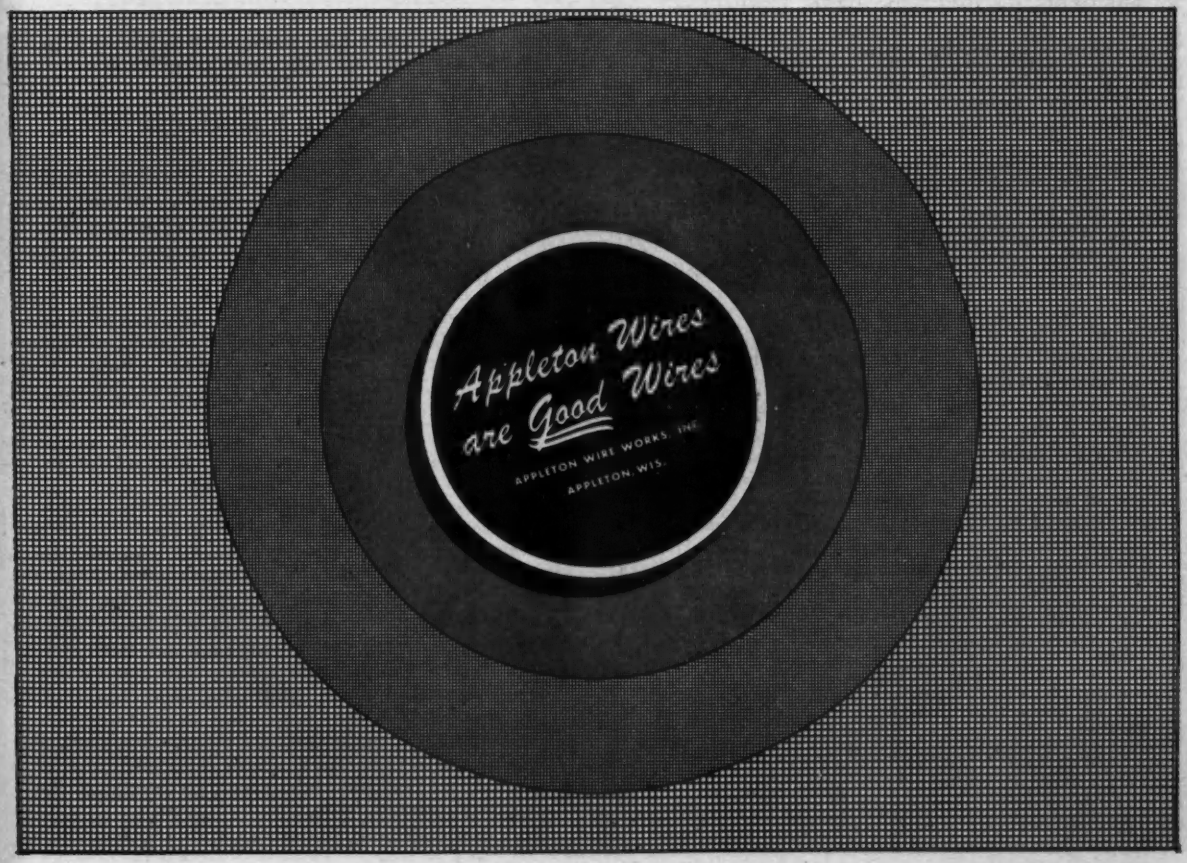

New York Paper and Pulp Market Review

Paper Supply Expected To Continue Short In Kraft, Book and Printing Papers — Wood Pulp Supply More Dependent Upon Larger Pulpwood Receipts — Waste Salvage Below Expectations.

Office of the PAPER TRADE JOURNAL,
Wednesday, March 14, 1945.

The paper supply situation in the wholesale market continues to reflect slow deterioration. Current reports from many manufacturers' representatives, jobbers, and general paper merchants indicate that wholesalers' inventories are now at a record low level. The greatest scarcity is indicated in kraft papers and in book and printing papers. No relief from this very short supply situation is foreseen in view of the extremely heavy demand for major types of paper and paper board. It has been suggested that some relief would be afforded if government requirements could be reduced in the less essential forms of consumption. There is, however, little hope that this can or will be affected. The war effort must not be relaxed and large quantities of paper are considered essential for accelerating the day of victory.

The index of general business activity for the week ended March 3 declined to 143.3, from 146.3 for the previous week, compared with 144.8 for the corresponding week in 1944. The index of paper board production was 150.8, compared with 153.4 for the previous week, and with 146.9 for the corresponding week in 1944.

Paper production for the week ended March 3 was estimated at 89.3%, compared with 87.0% for 1944, with 93.0% for 1943, with 102.7% for 1942 and with 90.1% for the corresponding week in 1941.

Paper board production for the week ended March 3 was 95.0%, compared with 95.0% for 1944, with 93.0% for 1943, with 101.0% for 1942, and with 80.0% for the corresponding week in 1941.

Production of paper per employee, the American Paper and Pulp Association reports, rose from 98 tons in 1939 to 117 tons in 1944. The average work week has increased from 39.2 to 49.4 hours and wages have risen from $176,000,000 to $329,000,000 in 1944. Labor cost per ton of paper has increased 50% and prices have risen 20% in that period.

Wood Pulp

A short chemical wood pulp supply situation is indicated until current heavy requirements for the war can be reduced. Although some relief can be expected through increased salvage of waste paper, best results can be expected from increased pulpwood cutting. Considering the handicap of a serious shortage in manpower, pulpwood receipts of 16,468,000 cords in 1944 was excellent. Increased military demands for all types of paper and paper board for 1945, have increased the pulpwood goal to 17,500,000 cords. Lack of trucks and a short supply of tires, are hampering shipments of pulpwood to the mills, late reports state.

Rags

Mill demand for new cotton cuttings is heavy and insistent. The market is reported the strongest in history. All grades are in heavy demand. Prices are very strong at ceiling levels.

Trading in old cotton rags is active. Reports indicate that the demand for roofing grades is expected to continue heavy, in view of the greatest home building program ever, in prospect, which will start as soon as present restriction of materials can be removed.

Old Rope and Bagging

Demand for good Manila rope continues in excess of limited supplies. Jute fiber continues slow. No important change has been reported in the fiber market this week.

Mill buying of scrap bagging is reported less active at this date. Volume is light. Prices are soft and continue nominal.

Old Waste Paper

Mill demand for old waste paper is heavy and supplies are inadequate to maintain required operating schedules. Collections are lagging and while Chicago and a few other centers currently report some improvement, the over-all salvage situation reflects no material increase in tonnage. Prices are strong at ceiling levels.

The American Newspaper Publishers Association announced on March 12 its plan to inaugurate a "Double-V Waste Paper Program to Speed Victory and Aid Veterans."

Twine

No important change has been reported in the twine market at this date. Demand is active in major available grades. Prices continue quite firm.

T. B. McCabe in Important Post

PHILADELPHIA, Pa., March 12, 1945 — Thomas Bayard McCabe, president of Scott Paper Company, will be Uncle Sam's No. 1 traveling salesman on April 15th. Taking a leave of absence as president of Scott Paper Company, he is to become the world's busiest traveling salesman with his accounts running into billions of dollars. Fortunately, he won't have to carry samples around with him. His line of goods has all the unwieldly variety of a down-country general store, like the one his father and grandfather ran at Salbyville, Del., where he was reared. President McCabe will be selling trucks and jeeps, airdromes and food, railroad cars, locomotives, filing cabinets, shoes, tractors, telephones and wires, automobiles, and other things too numerous to mention. In this, he is working for the government. He will be the manager for Uncle Sam of what must be the greatest clearance sale in history. More precisely and officially, the Secretary of War and the Secretary of the Navy have appointed him to be Army-Navy-Liquidation Commissioner, which means that he will have the job of disposing of all surplus property of the armed forces—except aircraft and Merchant Marine equipment—outside the United States and U. S. territories and possessions.

Mr. McCabe's personality and unruffled geniality are destined to win friends and influence sales all the way from England and Frances to Iran and New Guinea. He acknowledges that his job is colossal, in both the Hollywood and Webster sense of the word.

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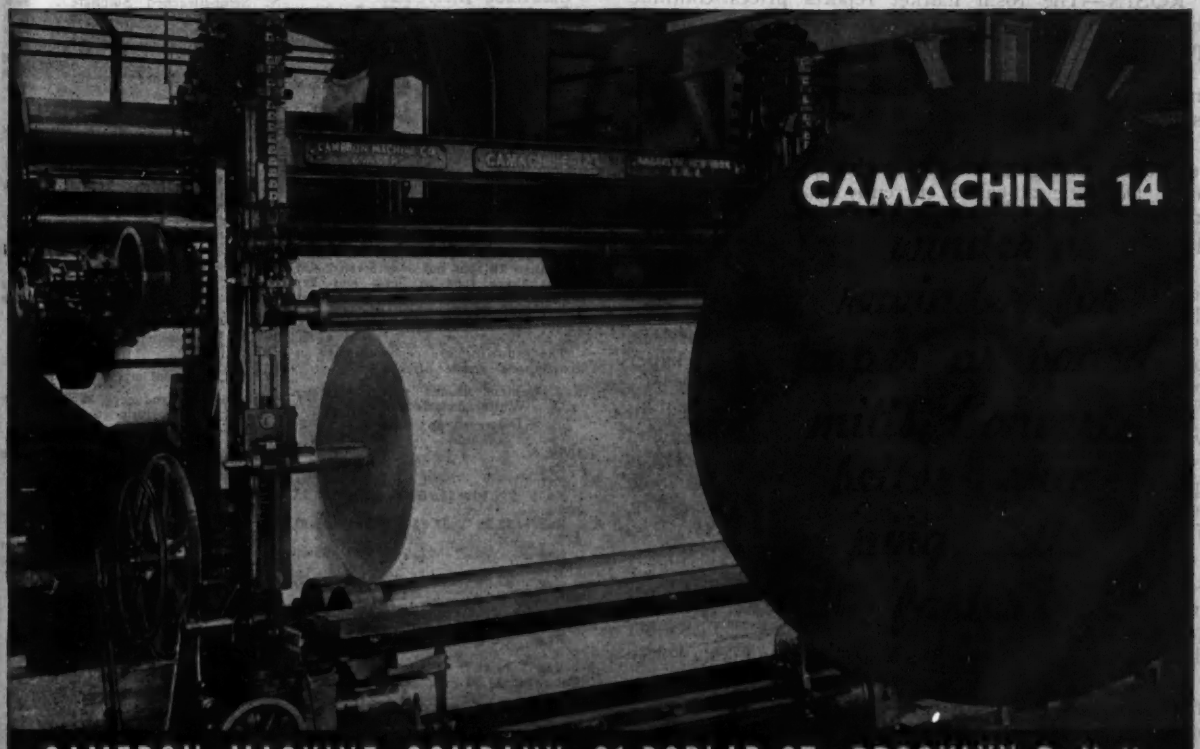

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, March 14, 1945.

BLANC FIXE—Prices on blanc fixe continue to conform to prevailing levels. Demand is reported fair. The pulp is quoted at $40 per ton, in barrels, at works. The powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—All-over demand continues heavy. Plant facilities expanded. Allocation removed on February 27. Quotations are unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound f.o.b. shipping point.

CAUSTIC SODA—Demand very heavy. Production large, but under demand. Market continues tight. Shipments delayed by traffic congestion. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CHINA CLAY—Current demand is reported moderate on many grades of china clay. Quotations unchanged. Domestic filler clay is quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Military and all essential requirements heavy. Tank car shortage reported at this date. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—The rosin market reports prices continue unchanged at ceiling levels. "G" gum rosin is currently quoted at $5.79 per 100 pounds, in barrels, at Savannah. "FF" rosin is currently quoted at $5.75 per 100 pounds, in barrels, at New York. Seventy per cent gum rosin size is currently quoted at $6.06 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake continue to be reported unchanged. December output lower at 50,879 tons. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All quoted prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand for soda ash is reported to absorb current production. Market is tight. Shipments delayed by traffic congestion. Prices continue to conform to prevailing levels. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn market less firm. Offerings in light volume. Freight car shortage delays shipments. Demand continues heavy. Prices unchanged on starch. Pearl is quoted at $3.72 per 100 pounds. Powdered starch is quoted at $3.83 per 100 pounds. All prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand good. Supply situation is favorable. Prices of the commercial grades are currently quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.85 per 100 pounds. All prices in bags, car lots, f.o.b. works.

SULPHUR—Current consumption of sulphur continues heavy. Market situation unchanged. The quotation on annual contracts continues at $16 per long ton, f.o.b. mines. The current price on contracts at Gulf Ports is $17.50 per long ton.

TALC—Demand reported good. Domestic grades are currently quoted at from $16 to $21 per ton at works.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$58.00	@	—
Sheets	66.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*50.00	@	—
Chip	*50.00	"	—
Sgl. Mla. Lt. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	32.20 "	37.75	33.35 "	39.25
85% Rag	.... "	....	29.90 "	35.00
75% Rag	23.00 "	27.00	24.15 "	28.25
65% Rag	.... "	....	22.80 "	27.75
50% Rag	18.70 "	22.75	19.90 "	24.25
25% Rag	16.40 "	20.00	17.55 "	21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$10.55	@ $12.75	$11.70	@ $14.25
No. 2	9.65 "	11.75	10.80 "	13.25
No. 3	9.20 "	11.25	10.35 "	12.50
No. 4	8.90 "	10.75	10.05 "	12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$15.5
No. 2 Glossy Coated	12.40	"	14.0
No. 3 Glossy Coated	11.60	"	13.2
No. 4 Glossy Coated	11.15	"	12.7
No. 1 Antique (watermarked)	10.25	"	11.7
No. 2 Offset	9.60	"	11.0
A Grade E. F.	9.35	"	10.7
A Grade S. & S. C.	9.60	"	11.0
B Grade E. F.	8.85	"	10.2
B Grade S. C.	9.10	"	10.5
C Grade E. F.	8.55	"	9.7
C Grade S. C.	8.80	"	10.0
D Grade E. F.	8.25	"	9.5
D Grade S. & S. C.	8.50	"	9.7

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.0
Unbl. Softwood Sulphite	74.0
Bl. Hardwood Sulphite	83.5
Unbl. Hardwood Sulphite	71.5
Bl. Mitscherlich	81.0
Unbl. Mitscherlich	72.00 @ 82.0
N. Bleached Sulphate	86.0
S. Bleached Sulphate	79.0
N. Semi-Bleached Sulphate	82.0
S. Semi Bleached Sulphate	75.0
N. Unbl. Sulphate	73.0
S. Unbl. Sulphate	63.5
Bl. Soda	76.0
Unbl. Soda	72.0
Groundwood	50.0

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum price.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25
Silesias No. 1	—	"	5.75
New Unbleached	6.75	"	7.50
Blue Overall	—	"	5.50
Fancy	—	"	3.50
Washables	—	"	3.00
Bleached Khaki Cuttings	—	"	4.25
Unbleached Khaki Cuttings	—	"	3.50

* OPA Maximum Prices.

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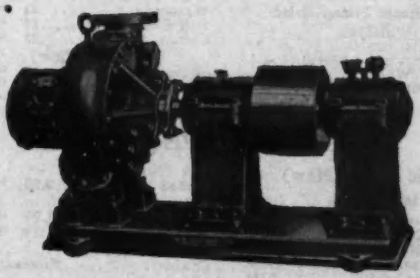

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Old Rags

White, No. 1—			
Repacked	*1.80	@	—
Miscellaneous	*1.20	@	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	@	—
No. 2	*1.45	@	—
No. 3 (bagging)	*1.35	@	—
No. 4	*1.35	@	—
No. 5A	*1.30	@	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	2.35
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Lingery Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shapperies	1.30	"	1.45
New Shapperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	@	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	3.00	"	—

*OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.34	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.38	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Prices to Mill.)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¼
Light Silesias	.05¼
Black Silesias, soft	.03¼
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable shredding	.01¾
Fancy Percales	.04¼
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	2.80	@	—
Miscellaneous No. 1	2.20	"	—
Miscellaneous No. 2	2.65	@	—
White No. 2—Repacked	2.90	@	—
Thirds and Blues—			
Miscellaneous	1.80	@	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	@	—
Domestic No. 2	1.45	@	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	@	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.10
No. 1 Clean bright—			
Sisal Strings			.84
No. 2 Clean bright—			
Sisal Strings			.80
Sisal Jute	.02½	@	.02¾
Scrap—			
No. 1	2.25	@	2.30
No. 2	1.75	@	1.80
Wool Tares, hea	4.00	@	4.10
No. 1 New Light Burlap	3.00	@	4.00
New Burlap Cuttings	3.75	@	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	@	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	@	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	—	@	2.50
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*4.25	"	—
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	5.25	"	—
Jute Car WThreads	3.00	@	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	—	"	2.75
South American	—	"	3.00

*OPA Maximum Prices.

Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.60
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	@	2.60
No. 2 Roofing Bagging	1.35	"	—

*OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.04
New White No 1	.06¼	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¼	"	.06½
Underwear Cutters, Unbleached	.05¼	"	.06
Silesias No. 1	.06	"	.06½
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06¼	"	.06½
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03½
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.06¼	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	2.80	@	—
Miscellaneous	2.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.80
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

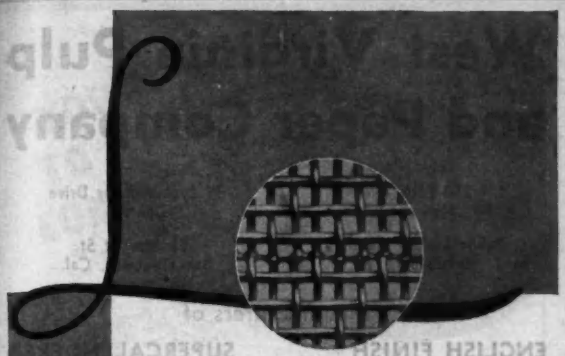
CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.35	"	—
No. 1 Roofing Bags	1.45	"	—



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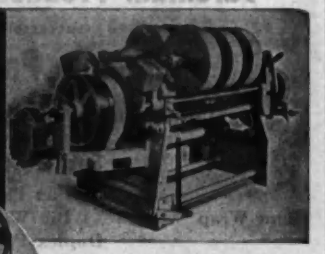

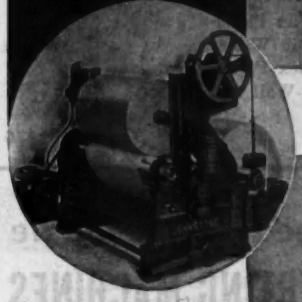

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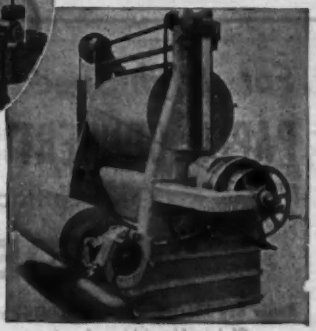

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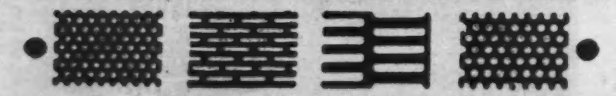

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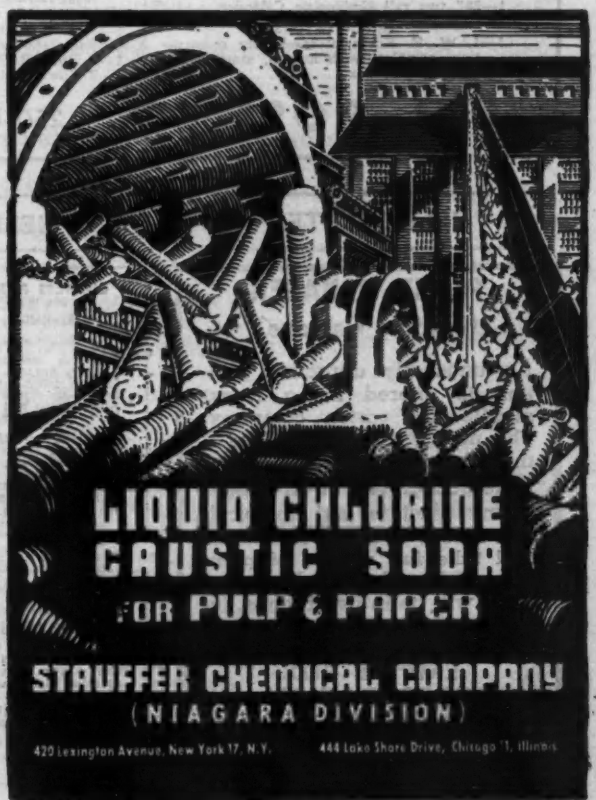

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1—1200 lb. Stout, Mills & Temple Iron Tub Beater.
1—500 lb. Gavit—iron tub beater.
2—400 lb. Gavit—iron tub beaters.

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1—#6 Sturtevant.
1—50" Buffalo.
Various other sizes.

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1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—77" 2-roll—Moore & White.
1—86" 5-roll—Black-Clawson.

SUPER CALENDER STACKS

1—7 roll 50" face.
1—7 roll 44" face.

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1—Shartle Brothers Centrap.

CYLINDER MOULDS

1—48" Diameter x 96" Face.
8—30" diameter x 72" face.
3—30" diameter x 74" face.
2—36" diameter x 118" face.
1—30" diameter x 71" face.
1—36" diameter x 90" face.

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2—D. O. James 75 H.P. Speed Reducers with couplings and motor bases. Ratio 2.16 to 1. 900 RPM to 418 RPM.

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18—Dryers — 36" Diameter x 94" Face — complete with 2-deck Frames, etc.
1—48" diameter x 94" face.
2—30" x 44" face—with frames and bearings.
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
3—36" diameter x 116" face.
2—28" diameter x 68" face.

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1—28" two roll Embossing Calender.

ERKENSTATORS

3—I. W. E. Erkenstators—bronze construction—complete with motors, starters and distributing box.

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1—Packer type 14 plate flat screen — with Witham fasteners and scraping devices.

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1—600 ton Dunning & Boschert hydraulic Pulp Baling Press—low and high pressure hydraulic pump, valves, piping, etc.—Platen 38" x 38"—ram 20" diameter—daylight 50"—stroke 36".

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1—Black-Clawson Jordan (belt driven).
1—#9 Emerson Jordan—for direct connection of a motor—requires use of 400 H.P. motor.
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1—100 H.P. General Electric Synchronous Motor—450 R.P.M.—Late type, including starting equipment.
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1—45" Black-Clawson paster.

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1—Eaton, Cole & Burnham Company pipe threader—2" to 8"—complete with dies.

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1—32" three pocket Glens Falls Grinder (for 27" wood).
2—Rotary incinerators—9' diameter x 20' long.

PULPERS

1—#2 Lamnoye Pulper.
2—Jones Pulpers—direct connected to 60 H.P. motors—3 phase, 60 cycle, 440 volts —forward and reverse starting.

PUMPS

1—Buffalo Pump—5500 g.p.m., direct connected to 100 H.P. Motor (50' head).
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

REELS

1—2 Bowl Reel — 112" face — bowls 20" diameter.
1—2 Bowl Reel—63" face.
1—2 Bowl Reel—110" face.

ROLLS

500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

RUBBER COUCH ROLLS

1—72¾" Face x 9" diameter (soft rubber).
1—84¼" face x 16" diameter (soft rubber).

SAVEALLS

2—#5 Bird Savealls.
1—North Save-all—cylinder mould 72" diameter x 100" face.

SHREDDERS

1—Jeffrey swing hammer type shredder—size 24" x 18"—antifriction bearing equipped.
1—#25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder—used one year.
1—Taylor Stiles #5 Pulp Shredder.

SHEETERS

1—103" Hamblet Single Knife Sheeter — complete with Slitting Device.
1—110" Horne single knife rotary sheet cutter.

SLITTERS

1—114" Two drum Langston Slitter and Winder.
1—110" Beloit slitter (slitter attachment only)
1—114" Two drum Kidder slitter and winder.
1—60" Kidder slitter and winder.
1—36" Koegel Slitter & Winder.

SUCTION BOXES

1—Nash 100" face Suction Box.
1—Nash 125" face Suction Box.
3—Brass Suction Boxes—90" drilled face.
2—Brass Suction Boxes—77½" drilled face.

SUCTION COUCH ROLL

1—Sandusky Suction Couch Roll — 18" diameter x 130" face — Complete with Sturtevant Vacuum Pump and drive mechanism.

SUCTION PRESS ROLLS

1—Sandusky suction press roll, Bronze — 14-5/16" diameter x 77" drilled face.
1—Sandusky Suction Press Roll—14-5/16" diameter x 68" drilled face.

SUCTION PRESS SHELL (only) BRONZE

1—18" diameter x 94" drilled face.

TRIMMER

1—40" National Self Clamping Cutter.

J. J. ROSS CO., 250 Frelinghuysen Avenue, Newark 5, New Jersey
TEL. BIGELOW 3-3720

HELP WANTED

PLANT MANAGER
(Folding Cartons)

An unusually attractive position is offered by a large, middle-west carton company. The man we want must be a thorough executive with a complete background of all phases of manufacture and an excellent record of achievement. He will take full charge of planning and production. Remuneration will be in five figures, including a profit-sharing bonus.

EMPIRE BOX CORPORATION
919 N. Mich. Ave., Chicago
M-22

HELP WANTED

CHARLES P. RAYMOND SERVICE, INC.
254 Washington St., Boston, Mass.
Specializing in Paper Mill Personnel

Positions Now Open

Executive mechanical engineer, designer, etc. Salary $10,000—20,000 year
Chemist $3000-5500 year
Comptroller $5000 year
Glue chemist and salesman
Four boss, men for cylinder and fourdrinier mills
Superintendent cylinder jute mill
Draftsmen, master mechanics and plant engineers And many others.

We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. M-15

WANTED—CHEMIST

Chemical manufacturer has opening for a man with broad experience in the pulp and paper industry and preferably with graduate training in chemistry. Experience in the paper converting, synthetic resins or plastics fields would be helpful. Excellent opportunity for a man capable of conducting and supervising important development work.

Address Box 45-150 care Paper Trade Journal. M-22

HELP WANTED

WANTED

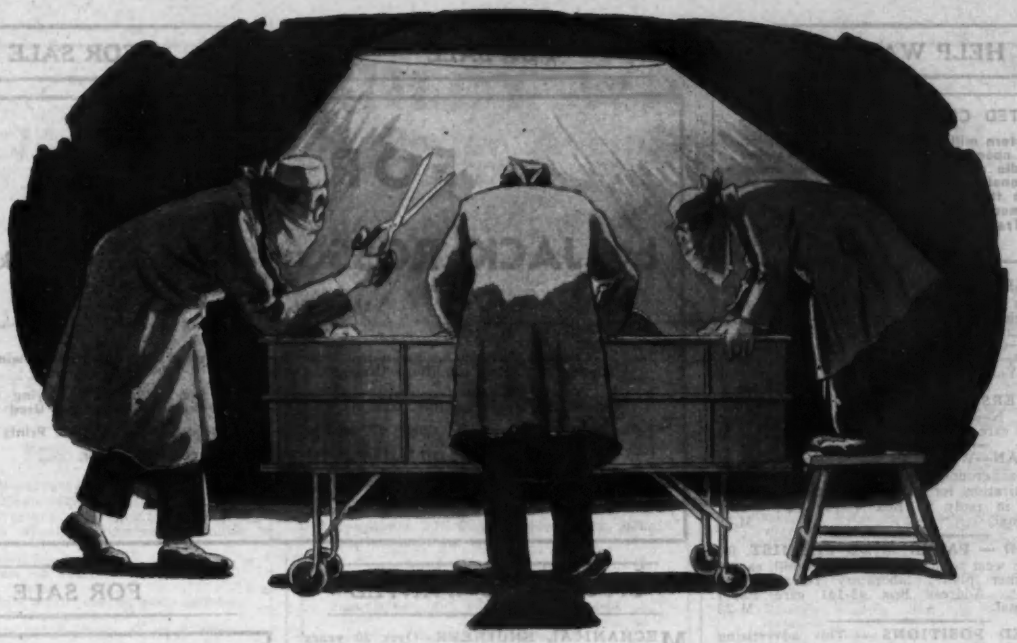
ENGINEERS and DRAFTSMEN experienced in pulp and paper mill design and process by Consulting Engineers. Address Box 45-146 care Paper Trade Journal. T.F.

MASTER MECHANIC

A large eastern folding carton manufacturer offers an exceptional opportunity for present and future advancement to a man qualified to take complete charge of its maintenance work. Because of post-war future, involving large expansion program, we believe that this position offers greatest compensation.

EMPIRE BOX CORPORATION
70 Outwater Lane, Garfield, N. J.
M-22

SALESMAN for large folding carton and specialty manufacturer. Unusual opportunities. Give full qualifications, age and draft status. Replies held in strictest confidence. Address Box 45-110 care Paper Trade Journal. M-15



Call the Coroner...

If a careful diagnosis of your beaters shows them to be in bad shape, pronounce them dead and install Dilts "hydrafiners." Don't be pennywise and pound foolish—throw away good money—on repetitious repairs.

Dilts hydrafiners are modern and infinitely more effective. They are:

Precision built to close tolerances.
Compact and save floor space.
High-speed units hence high capacity refiners.
Continuous or batch, as required.
Highly successful on all types of stock.

Used in lieu of beaters and alone on virgin pulps.
Used in conjunction with breaker beaters or mixed papers.
Used with Dilts hydrapulpers to produce "hydrafined" papers.

Remember, your mill can progress only by going forward.
That's why we say discard those old beaters.
Go modern. Go *hydrafiner*.

THE DILTS MACHINE WORKS, Fulton, New York

SHARTLE BROS., MIDDLETOWN, OHIO.
DIVISIONS OF BLACK-CLAWSON CO., HAMILTON, OHIO.

Dilts

HELP WANTED

WANTED CHEMIST OR ENGINEER

Midwestern mill, making high grade papers, has an opening for a chemist or engineer to handle control and development work. Exceptional opportunity for advancement, both in this field and in the Production Department. Address: Box 45-122 c/o Paper Trade Journal.

M-22

ENGINEERING DRAFTSMAN for Post War Design and Development Paper Mill Machinery. Experience in Paper Mill Equipment Design Helpful. Location Northern ..ew Jersey. State experience. Certificate availability necessary. Write Box 44-527, Paper Trade Journal, 15 West 47th St., New York, 19, N. Y. tf

ADJUSTERS — Grocery Bags and Sack Machines. New York Plant. Good pay. Address Box 45-132 care Paper Trade Journal. M-15

SALESMAN—With paper maker or paper chemistry background. Splendid opportunity with alert organization for man with initiative. Give all details in reply to Box 45-139 care Paper Trade Journal. M-29

WANTED — PAPER MILL CHEMIST for middle west combined paperboard mill, carton and container plant; laboratory research and development. Address Box 45-141 care Paper Trade Journal. M-22

SALARIED POSITIONS — This advertising service of 35 years' recognized standing negotiates for high salaried supervisory, technical and executive positions. Procedure will be individualized to your personal requirements and will not conflict with Manpower Commission. Retaining fee protected by refund provision. Identity covered and present position protected. Send for details. R. W. BIXBY, INC., 117 Delward Bldg., Buffalo, 2, N. Y. tf

SUPERINTENDENT—Experienced, Self Opening, Squares, Flats, Sacks, Specialties. To take full charge of Bag Plant. Give full data. Address Box 45-126 care Paper Trade Journal. M-22

WANTED MEN—Experienced in paper converting. Starting additional plant for cutting, laminating, coating and shredding in central Indiana. Essential work. State age, experience and salary expected. Address Box 45-157 care Paper Trade Journal. M-22

MIDWEST MANUFACTURER of ordnance, waxed and specialty papers, desires research chemist and chemical engineer for technical development and control. Knowledge of waxes, resins and cellulose derivatives preferred but not essential. Excellent post war future with established firm. W.M.C. referral necessary. Expenses paid for midwest interview. Address Box 45-159 care Paper Trade Journal. M-22

WANTED—Experienced man in order department of wholesale wrapping paper house. Good opportunity. Write stating age and experience. Answers will be held in confidence. Address Box 45-160 care Paper Trade Journal. M-15

SALES AND SERVICE ENGINEER to call on trade regularly at least every three months to check on operation of pulp and paper mill equipment for maintenance, sales of repair parts, etc. Must have had shop and mill experience. Address Box 45-161 care Paper Trade Journal. M-15

PLANT MANAGER—Established Philadelphia Plant making high quality bags (self-opening, squares, flats, sacks, specialties) wants plant manager experienced in handling production and personnel in union shop. Exceptional opportunity for advancement. Give full qualifications, age and draft status. Replies held in strictest confidence. Address Box 45-167 care Paper Trade Journal. M-29

SITUATIONS WANTED

PRODUCTION MAN—Thoroughly experienced in production and supervision all varieties fine cardboards. Successful record personnel relations Address Box 45-4 care Paper Trade Journal. M-29

MANAGER—Toilet Paper Converting Plant. Will furnish more details to interested parties. Address Box 45-106 care Paper Trade Journal. M-22

FOR SALE

FOR SALE

FOR SALE

by JACK ROSS 17 Porter Avenue, Newark 8, N. J.

Waverly 3-5675

1—72" Cameron Slitter and Rewinder; #10 Camachine with mill roll stand rewind with 36" diameter. Excellent condition. Used four years.

1—64" Waxing Machine complete with vats unwind and rewind with drying rolls manufactured by Mayer Coating Machine Co., Rochester. Excellent condition. Used three years.

3—Improved Paper Machy. Corp. #2 Knotters Bronze fitted. Good condition. Prints on request.

1—#2 Miami Jordans 5/8" brnze fillings for direct connection to motor.

1—65 ton Vertical Lime Kiln.

M-15

SITUATIONS WANTED

MECHANICAL ENGINEER—Over 20 years' experience in pulp, paper and board mills in both the kraft and sulphite processes. Thoroughly versed in all phases of engineering, power and operation. Very capable of supervising and handling men. Have held positions as Chief Engineer, Plant Engineer and in managing capacity. Able to take over on short notice. Invites correspondence. Address Box 45-111 care Paper Trade Journal. M-15

PURCHASING AGENT—Age 30 to 40. Volume purchase experience necessary. Post war opportunity. Give complete resume and salary desired. Address Box 45-121 care Paper Trade Journal. M-29

PLANT ENGINEER with many years experience in design, construction and maintenance of pulp and paper mills, desires position. Address Box 45-128 care Paper Trade Journal. M-15

SUPERINTENDENT—25 years experience in Book, Bond and Specialty Mills, using Kraft Sulphite, Rag Stock, De-inked stock, Soda Pulp, etc. 40 years of age. Conscientious, aggressive and capable of taking complete charge. Address Box 45-148 care Paper Trade Journal. A-12

SUPERINTENDENT—20 years experience in paper bag conversion of grocery, sacks and aniline or oil ink printed specialty bags. Capable of handling all bag shop problems. Thorough experience in supervision of help, maintenance and repairing of machines. Address Box 45-155 care Paper Trade Journal. A-5

EXPORT—Advertiser, and American (above draft age), with broad experience in the paper exporting field, also several years of residence and travel in Latin America, desires position as export manager with manufacturer or paper exporting concern. Address Box 45-156 care Paper Trade Journal. M-29

TECHNICAL SUPERVISOR — Age 30, with broad experience in Water Purification, desires position as Operator of Water Softening and/or Filtration Plant. Resume sent on request. All replies strictly confidential. Address Box 45-166 care Paper Trade Journal. M-15

SUPERINTENDENT for Board Mill on high grade folding boards, sulphite and ground wood specialties, kraft boards, etc. Address Box 45-154 care Paper Trade Journal. M-29

PAPER CHEMIST—Engineering graduate. Now employed—desires change. Wide experience. Research - Mill - Converting - Executive background. Wants position in paper industry with postwar future. Address Box 45-153 care Paper Trade Journal. M-15

FOR SALE

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore, 30, Md. TF

FOR SALE

FOR SALE

2—10" diameter x 119" face new calender rolls.
1—24" diameter x 136" face Downingtown extractor roll.
1—24" diameter x 120" face Downingtown extractor roll—can cut down.
1—22" diameter x 133" face brass covered press roll.
1—22" x 135" face brass covered press roll.
1—22" x 132" rubber covered press roll.
13—7" diameter x 139" copper covered felt rolls.
2—128" wide Vickery felt conditioners—can cut down.
1—#3 Nash vacuum pump.
2—10 x 15 Moore & White triplex stuff pumps.

SHARTLE BROTHERS MACHINE CO.
Middletown, Ohio M-22

FOR SALE

1—Oliver United Filter 8 ft. 6 inches diameter. Fully reconditioned
1—No. 2 Bird Screen with copper vat and copper flow boxes
1—85 H.P. Terry Steam Turbine designed for 110# steam pressure, 5# back pressure
30—Rice, Barton & Fales Dryers—36" x 88" with triple deck frames
1—Set 110" two-spool Reels, 16" diameter
4—Sets Marshal Drives with Horton Clutches
1—Jones 1500# Iron Tub Beater (roll nearly new)
1—Emerson No. 1 Jordan, belt driven, Bahr Bros. fillings
1—Jones Standard Jordan, belt driven
1—Gould 1500 GPM Centrifugal water pump, designed for direct connecting, coupling but no motor
1—No. 2 Lannoye Pulper
60 Bronze Screen Plates for E. D. Jones Screen, cut .018
2—Sets New Fly Bars, 60" long for E. D. Jones bandless rolls

OSBORNE PAPER MILL EQUIPMENT CO.
FULTON, N. Y. M-15

FOR SALE—Valley Iron Works 100 lb. Batch Beater; 2 - Rosback 42" Confetti Machines. BRILL EQUIPMENT COMPANY, 225 W. 34th Street, New York, 1, N. Y. M-22

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By JACK ROSS 17 Porter Avenue, Newark, 8 N. J.

Waverly 3-5675

Cash purchaser of all types of paper, pulp and converting equipment.
From single items to complete plants.
Write, telephone or wire whatever you have for sale.

FOR SALE

FOR SALE

1—#1 Nash vacuum pump
3—12 x 12 Gould triplex stuff pumps
1—8 x 10 Worthington triplex stuff pump
1—Noble & Wood belt driven Monarch Jordan
2—8 x 6 Beloit fan pumps
2—Horne iron tub beaters
1—Holyoke beater
2—Horizontal wood chests and agitators about 8' diameter x 13' long
2—Horizontal wood chests about 9' diameter

SHARTLE BROTHERS MACHINE COMPANY
Middletown, Ohio
M-22

FOR SALE

1—Complete 98" Fourdrinier Paper Machine with 26 Dryers, 48" diameter x 96" face, including auxiliary equipment. Additional details on request.

J. J. ROSS COMPANY
250 Frelinghuysen Ave., Newark 5, N. J.
Telephone Bigelow 3-3720

FOR SALE

1—Hydraulic Press with frames, capable of handling shafts 15 ft. long
1—No. 17 Foote-Burt three spindle drill
1—3A Mitts Merrill Keyseater
1—32" Bickford radial drill press
1—75 KVA gasoline engine, portable generator set
1—Small 9 KVA unit

FRANK H. DAVIS CO.
175 Richdale Ave., Cambridge 40, Mass.
M-15

FOR SALE

New and guaranteed used steel pipe, boiler tubing, valves, fittings, wood and steel tanks, steel buildings

JOS. GREENSPON'S SON PIPE CORP.
NATIONAL STOCK YARDS, Illinois.
S-6

FOR SALE

1—9-roll 88" calender stack
1—11-roll 104" calender stack
1—jordan with 49" plug

SHARTLE BROS. MACHINE CO.
Middletown, Ohio
M-15

FOR SALE

FOR SALE

5 Four-pocket Sandy-Hill pulp grinders each with 1000 H.P., 2300 volt motor, 60" diameter x 27" Carborundum stone, lathe, and temperature control.

1 Four-pocket Carthage Machine Company pulp grinder with 1000 H.P., 2300 volt synchronous motor, anti-friction bearings, lathes, and temperature control.

Priced to Move Quick.

SHARTLE BROTHERS MACHINE CO.
Middletown, Ohio
A-5

FOR SALE

1—Holyoke Machine Co., 3 roll, 44" finishing calender stack.

Brass lined journals—hand wheel and screw adjustment. Double flanged drive wheel. Unwinding and rewinding shaft. Two spare rolls.

General Electric Co., 50 h.p., slip ring induction motor. Predetermined speed panel. Rheostat and controller, 7½ h.p. threader motor, induction type.

Address Box 45-142 care Paper Trade Journal. M-15

FOR SALE

2—Vickery felt conditioners with 2 vacuum boxes each suitable for 128 rolls. Can Cut down.

SHARTLE BROS. MACHINE CO.
Middletown, Ohio M-15

PAPER MILL EQUIPMENT FOR SALE

65" Clark Sheeter with Erie Layboy and 16 roll backstand.
110" Hamblet Sheeter with 3 slitters and 4-roll backstand.
45" White Automatic Power Cutter.
68" Rice Barton & Fales Slitter & Rewinder, for use on dry end of paper machine.
63" Oswego Mill Type Cutter.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18, N. Y.
TF

FOR SALE — NEW #2 LANNOYE PULPER. ADDRESS BOX 45-113 CARE PAPER TRADE JOURNAL. M-15

FOR SALE—120" Moore & White four-drum Rewinder; 50" and 65" Slitters. Address Box 45-151 care Paper Trade Journal. M-15

FOR SALE—Complete Creping Machine three cylinders 60" diameter x 86" face with drive. Address Box 45-140 care Paper Trade Journal. M-15

FOR SALE—44" Seybold Cutter, guaranteed to be in good operating condition. Address Box 45-163 care Paper Trade Journal. M-15

FOR SALE

FOR SALE

45" Standard Beak Rotary Sheet Cutter.
62" Moore & White Rotary Sheet Cutter.
1—Noble & Wood Mammoth Jordan with new shell and plug fillings.
1—Standard Horne Jordan with extra shell and plug fillings.
1—Oliver Filter, 9' long, 11'-8" diameter.
3—Double-drum Warren Winders, 82", 103" and 104" wide.
1—Double-drum Bagley & Sewall Winder, 140" wide.
1—F. X. Hooper Single Color Printing and Slotting Machine, sizes 36" x 81". A-1 condition.
1—Mayer Equalizer Type Waxing and Coating Machine.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y.
TF

FOR SALE

1—Evaporator, 50 ton, made by Bethlehem Steel.

SHARTLE BROS. MACHINE CO.
Middletown, Ohio.
M-15

FOR SALE—Candy Cup or Bon Bon Machines. One 36" Band Knife cellulose cutting machine with slide table. Address Box 45-158 care Paper Trade Journal. M-15

FOR SALE—Waxing Machine 50" wide. Will wax wet wax paper and dry wax. Cold water cylinders. $1000 including motor. Address Box 45-162 care Paper Trade Journal. M-15

WANTED

WANTED

One Beater of 1,000 lb. capacity. Give complete description, specifications and price.

FOR SALE

42 Dryers consisting of 85" and 86" face—36" diameter, complete with triple deck stands, gears, bearings and piping.

EMPIRE BOX CORPORATION
Garfield, New Jersey
TF

WANTED

WANTED

CALENDER STOCK—16" INTERMEDIATE ROLL MINIMUM
ALSO
SHEETER—SINGLE OR DOUBLE CUT-OFF BOTH FOR 72" MACHINE

Address Box 44-728 care Paper Trade Journal. TF

WANTED

One (1) Laboratory Beater
Waterbury Hydraulic Drive size 5
11—60" Diameter x 92" Face Dryers
16—48" Diameter x 82" Face Dryers
4—36" Diameter x 92" Face Dryers

with gears, frames, felt rolls and cone pulley drives. Address Box 44-708 care Paper Trade Journal. TF

WANTED

WANTED—Any Item of Paper Tube and Paper Can Machinery, Slitters, Tube Winders, Cutters, etc. etc. We will buy such machinery in any condition. Theo. Adams, 111 W. Washington St., Chicago, 2, Ill. TF

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 44-835 care Paper Trade Journal. tf

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

WANTED

INDIVIDUAL interested in the purchase of small folding carton plant. Replies confidential. Address Box 45-134 care Paper Trade Journal. M-29

WANTED—#1 and #2 Nash Vacuum Pumps. Address Fort Howard Paper Company, Green Bay, Wisconsin. M-29

INTERESTED: In starting paper specialties in our present plant in addition to purchase of small paper converting plant or equipment. Address Box 45-165 care Paper Trade Journal. M-15

WANTED—Waxing Machine and slitter-rewinder for waxed paper. Must be in good condition. Address Box 45-168 care Paper Trade Journal. M-29

INTERESTED: In purchasing small bookbinding plant or equipment. Address Box 45-164 care Paper Trade Journal. M-15

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COOKING PROCESSES
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for accurate feeding of salt cake and other materials. Also weighs and totalizes the weight.

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Prepare NOW to Take Care of Increased Orders Which Will Come. Consider Necessary Repairs and Maintenance.
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PAPER BAG MACHINERY—PAPER MACHINES
THE NEW MODEL "E" PAPER TRIMMERS
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MANUFACTURING COMPANY
Plant and Offices at South Windham, Connecticut

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ASBESTINE FILLER
90% Retention
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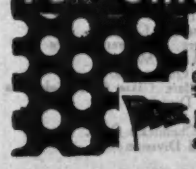

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Monsanto Chemical Co.
Norton Co.

ADHESIVES
Arabol Mfg. Co.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

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Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
H. K. Porter Company Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

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Potdevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BEARINGS
Black-Clawson Company
Jones, E. D. & Sons Co.
The Manhattan Rubber Mfg. Co.
Montague Machine Works
Railway Bearing Co.
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
SKF Industries Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BELTING
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machinery Corp.

BLEACHING APPARATUS
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company
Valley Iron Works Co.

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.

CALENDERS
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Fort Pitt Steel Casting Co., Div. H. K. Porter Company, Inc.
The Frederick Iron & Steel Co.
Grinnel Company
Hamblet Machine Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Smith & Winchester Mfg. Co.
Traylor Engineering & Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp
Ross J. O. Eng. Co.
Shartle Brothers Machine Co.

CHEMICALS
Aktivin Corporation
Amer. Cyanamid & Chem. Corp.
Ansul Chemical Co.
Calco Chemical Co.
Diamond Alkali o.
Dispersion Process Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co.
Hooker Electrochemical Company
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
The Nevilla Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

CLEANING MATERIALS
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
E. I. du Pont de Nemours & Co., Inc.
Oakite Products, Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Stearns Magnetic Mfg. Co.
Valley Iron Works Co.
T. B. Wood's Sons Company

COATING MACHINERY
Hudson Sharp Machine Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

CONSULTING ENGINEERS
W. H. L. D. Betz
Frederic C. Clark
W. R. Cliffe
Ferguson, Hardy S.
Hardy, George F.
Johnson & Wierk, Inc.
The Kohler System Company
L. I. M. E.
Merritt-Chapman & Scott Corp.
Main, Inc., Chas. T.
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

CONVEYORS
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elizman Paper Co.
Sonoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plohn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Mfg. Co.
T. B. Wood's Sons Company

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.

DIGESTERS
The Biggs Boiler Works Co.
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Shartle Brothers
United States Rubber Co.
Westinghouse Electric & Manufacturing Company

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Work
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric & Manufacturing Company

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc
Murray, D. J., Mfg. Co.
Traylor Engineering & Mfg. Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Merrick Scale Mfg. Co.
Leeds & Northrup
Traylor Engineering Co.
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc
Draper Bros. Corp.
Fitchburg Duck Mills
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Work
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
International Pulp Co.
W. H. Loomis Talc Corp.
Union Talc Co.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp.
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Klemp, W. F., Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Robinson, C. F.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Work
Shartle Brothers Machine Co.

WHERE TO BUY

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Covel-Hanchett Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Dietz Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
H. P. Bowsher
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
S. F. Perkins & Son
Taylor Instrument Cos.
Wallace & Tiernan Co., Inc.
Westinghouse Electric & Manufacturing Company
Wilkens-Anderson Co.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dietz Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Dietz Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Tabor Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
Tide Water Associated Oil Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Walker-Goulard-Plesha Co

MIXERS
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric & Manufacturing Company

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
The Norwood Engineering Company
Perkins & Son, Inc., B. F.

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
Kemp, W. F., Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
The Richardson Economy Plug Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer G.

PUG MILLS
Traylor Engineering & Mfg. Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp

RECOVERY SYSTEMS
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

RECTANGULAR BINS
Traylor Engineering & Mfg. Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dietz Machine Works
The Hermann Manufacturing Co
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric & Manufacturing Company

RESINS
American Cyanamid & Chemical Corp.
The Neville Company
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Reeblen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sheanago-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Merrick Scale Mfg. Co.

SCREEN PLATES
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co
Valley Iron Works Co.

SCRUBBERS
Traylor Engineering & Mfg. Co

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZING
American Cyanamid & Chemical Co.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co
National Oil Products Co
Paper Makers Chemical Department Hercules Powder Co.
Pioneer Salt Company
Socony-Vacuum Co.
Philadelphia Quartz Co.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SPRAY NOZZLES
The Spray Engineering Co.

STARCH
American Cyanamid & Chemical Corp
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

WHERE TO BUY

STEAM SPECIALTIES
Lebanon Corp.
Sturtevant Mill Co.
Stickle Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric & Manufacturing Company.

SULPHUR
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

TALC
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

TANKS
Frederick Mfg. Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt

J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

THICKENERS, DECKERS & SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

TITANIUM
E. I. Du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRUCKS
Elwell Parker Electric Co.
Wright-Hibbard Ind. Elec. Truck Co.

TRAPS
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

TUBS
Rodney Hunt Machine Co.
Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.

General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric & Manufacturing Company
Worthington Pump & Machinery Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

VALVES
Crane Company
Dilts Machine Works
The Foxboro Company
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

VATS & VAT PARTS
Union Machine Co.
Union Screen Plate Co.

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
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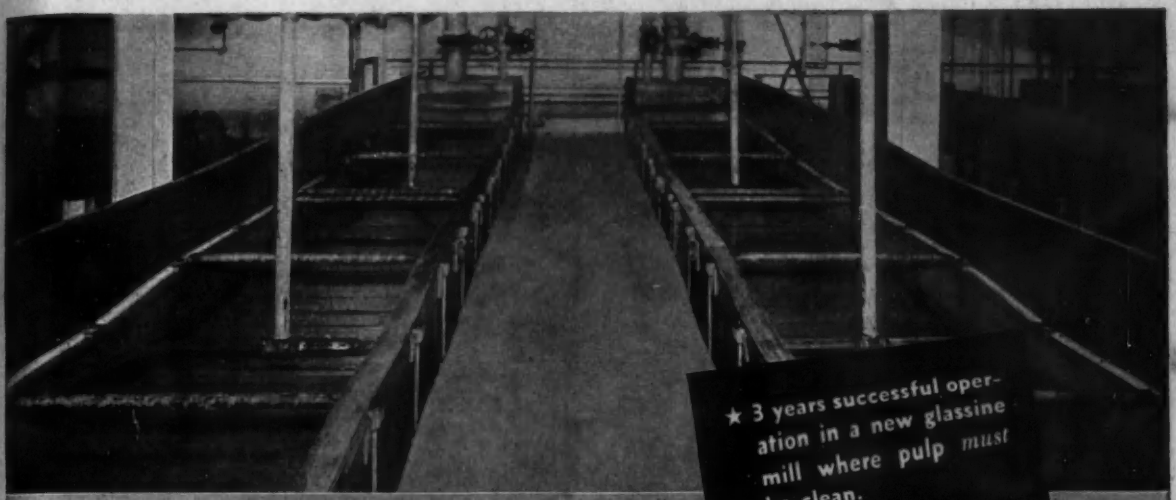

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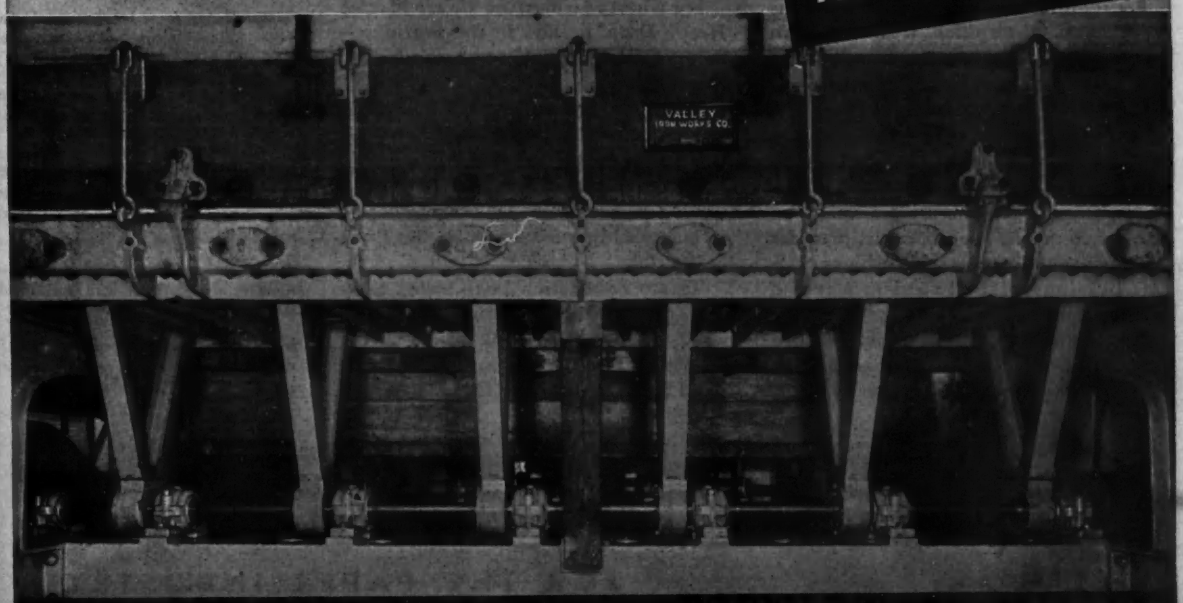

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